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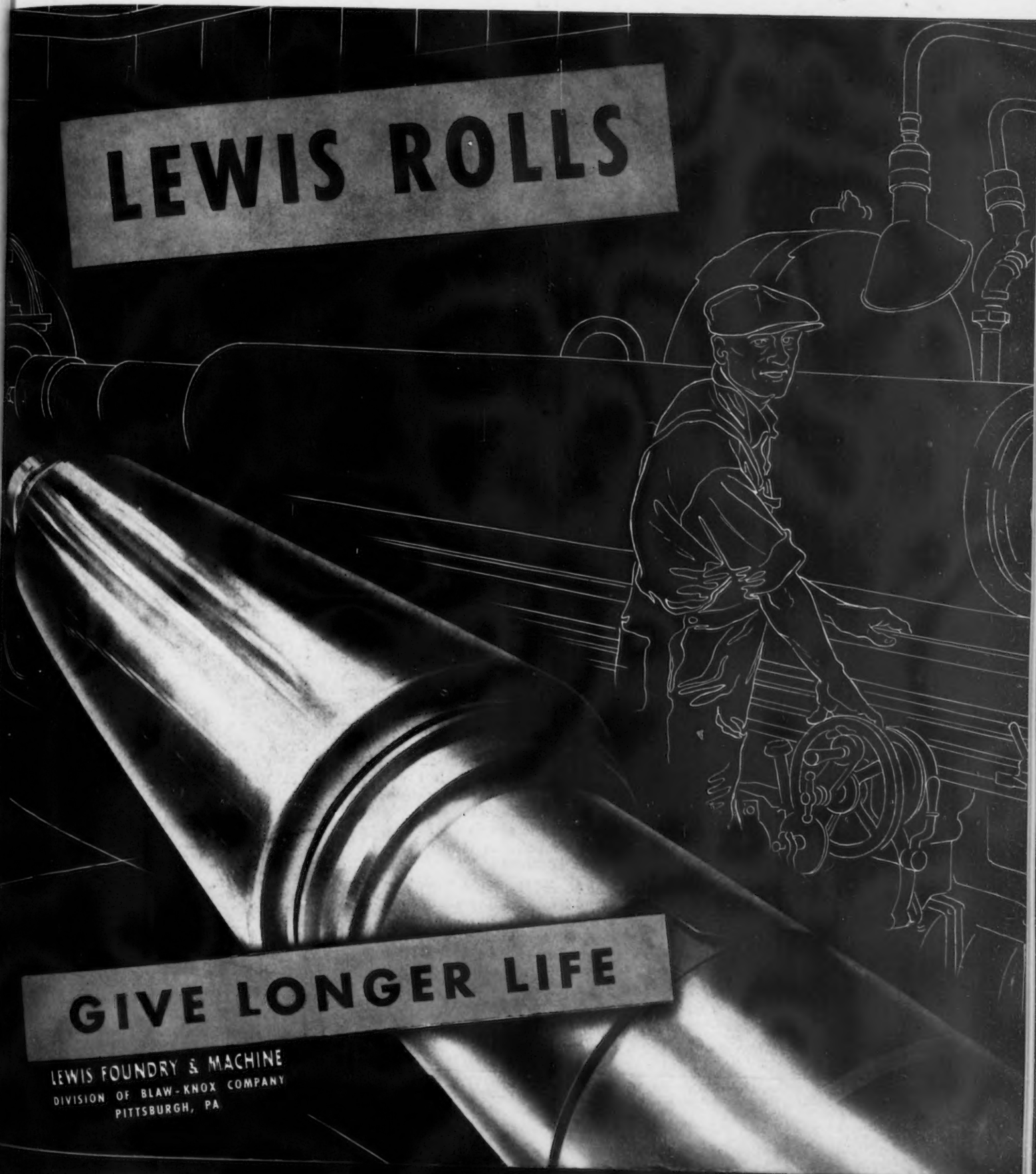
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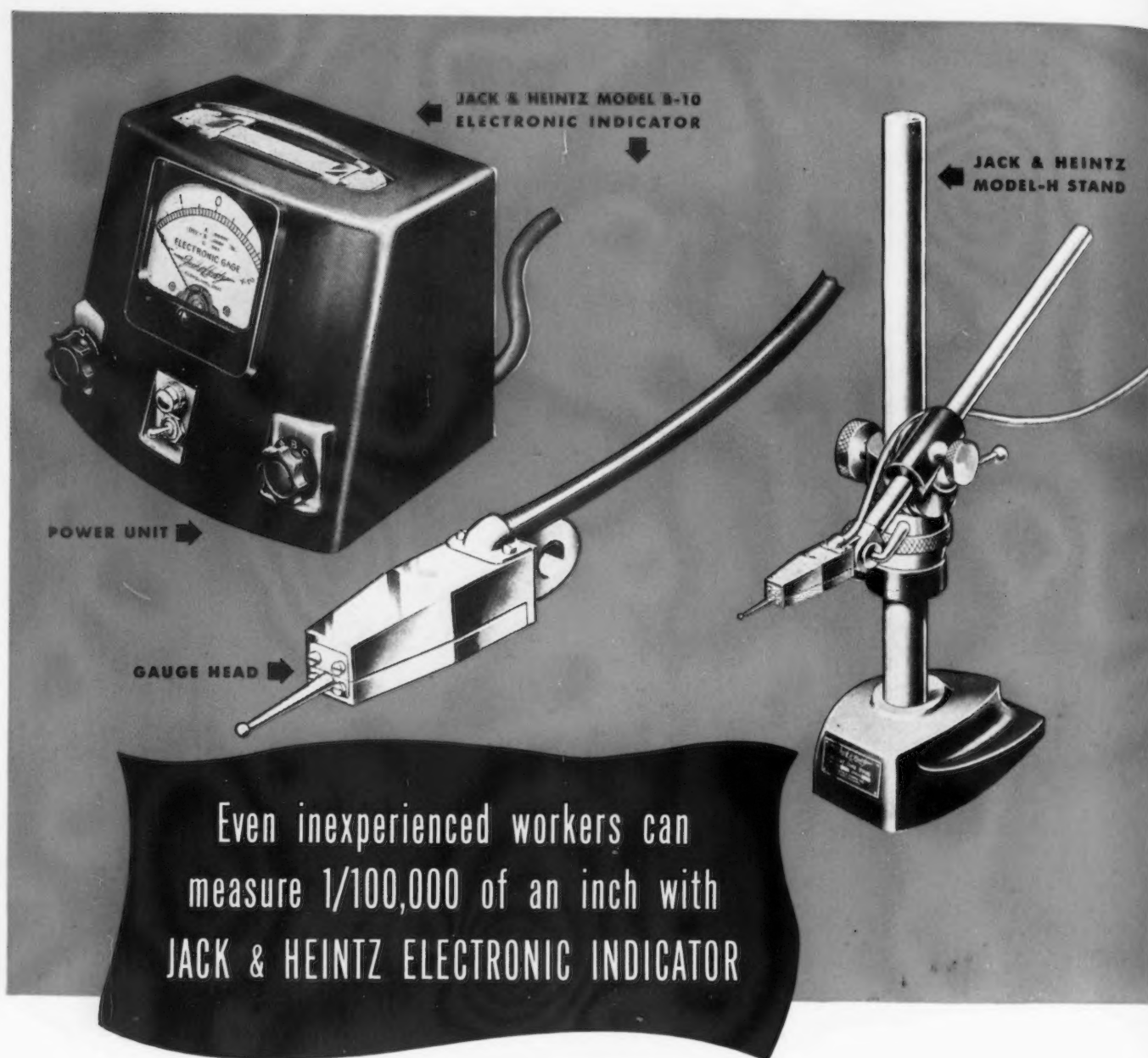
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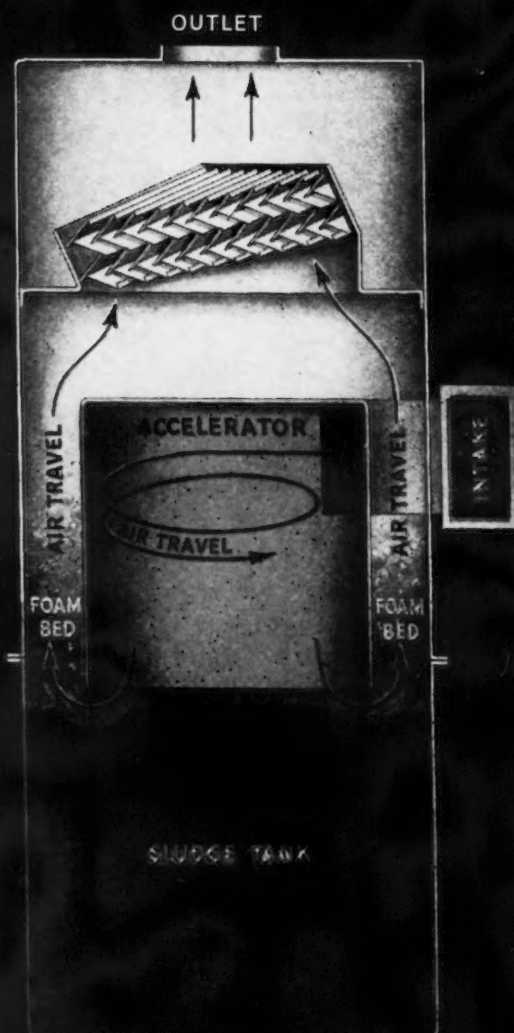
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## The Bowlesian Bulge

I SEE by the papers, as Mr. Dooley of sacred memory would have said, that the government has now permitted just a little bulge in the inflation line.

You children who enjoy bedtime stories or fireside chats may be lulled to sleep by this pronouncement, but in the cold hard light of morning, "it just ain't so."

It is a rather difficult matter to control a bulge, as most of us over 40 have found out. And personally, I question whether the Administration is willing to go through the course of dieting and exercise necessary to offset that comfortable growth of the periphery known as the pot belly.

Pronouncements from Washington tell us that everything will be "okey dokey" after the steel strike settlement, which was not at all a quarrel between steel management and labor but a realization on both sides that you can't divide what "ain't."

To think, however, that this is going to settle the matter is indeed thinking on a wishful plane.

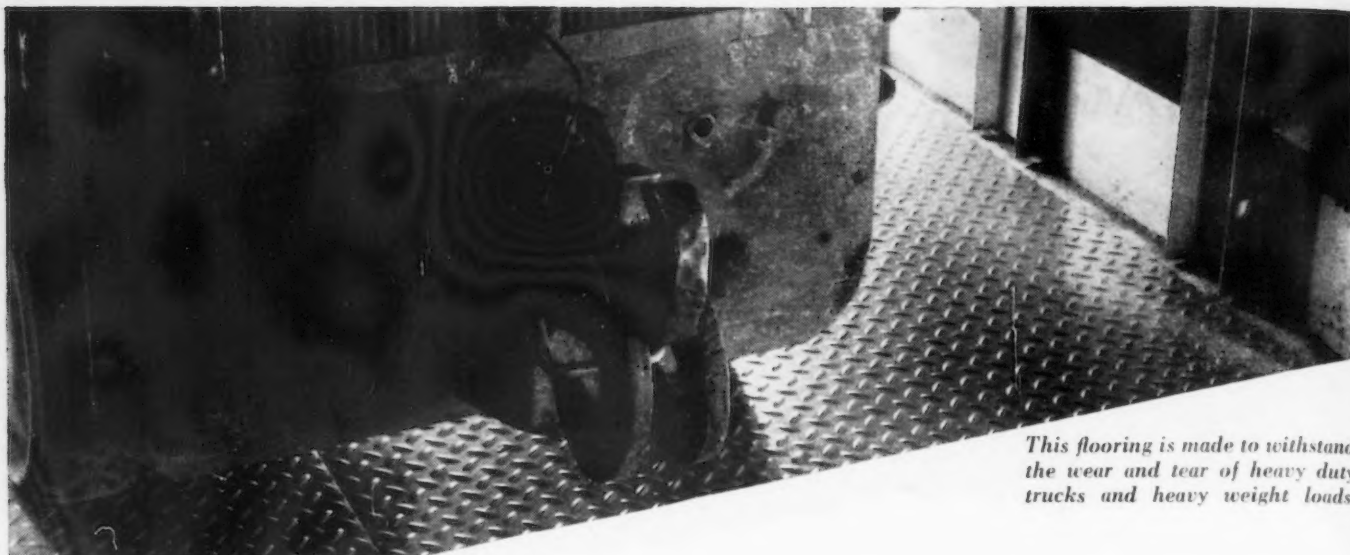
The steel price rise, for example, is just about enough to offset the present steel wage rise. But along about April first, John Lewis of the bushy brows will make his entrance on the stage with demands for a wage hike in the coal industry. My prediction is that he will get it. In the meantime, the railroad brotherhoods have set the stage for a hike in transportation costs. Communication services, such as telephone and telegraph, are not far behind in the inflation procession. Following in the wake of the Administrative handout, termed euphemistically "a little bulge," will come every group or description of organized labor that is not asleep at the switch, including the switchmen, and then the farmers.

Before we get through with this progressive procession, my prediction is that the dollar of 1932 will be worth not more than 50¢. And that the war bonds that you bought in 1942 will have shrunk in purchasing power to not more than 60 pct of their original purchasing power, accumulated interest included.

Who is to blame for this situation? Nobody and everybody. You cannot blame labor for wanting to start from scratch in the coming inflation period, instead of six months or a year behind it as has been its experience in the past. You cannot blame employers for wanting to get aboard the price rises that they see will be necessary to save them from bankruptcy when wages and the cost of materials go up as they will. If you want to put the finger on a scapegoat, put it on war. Somebody, and that means everybody, has to pay for war. The only way that we can pay for war without going broke is to increase productivity. To work harder than ever. To produce more per man per hour than ever before. To translate these gains into price reductions.

Wouldn't it be wonderful if Washington would tell us the truth about that instead of producing a phony formula in which A equals the wage rise, B equals the price rise and the unknown, X equals "what shall we do for money?"

*John H. Van Deventer*



*This flooring is made to withstand the wear and tear of heavy duty trucks and heavy weight loads.*



*Secure footing on jobs like this, or where men push or pull heavy objects, is another advantage of the 4-Way Plate.*



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# INLAND 4-WAY FLOOR PLATE



- Early reports from steel plants indicate that the resumption of normal production may take more time than first anticipated.
- Although additional steel warehouses will be set up on the West Coast by established steel distributors, it has been reported that sheet steel shipments from at least one eastern mill will be gradually reduced and then cut off. It appears that western sheet consumers may soon be required to depend on local production only.
- A new alloy wire containing equal proportions of nickel and iron has been developed for use in lamp manufacture. Two welds are required by conventional construction in order to join the three metals required for filament support, lead in, and wire passing through the glass seal which must have identical thermal expansion rates. The nickel iron alloy can be run straight through and is gas free in welding to thread and stud.
- Preheating high-speed steel for austenitizing reduces danger of cracking and warping from thermal shock and transformational stresses while minimizing the time required at high temperature. Increasing the solution of carbon and alloying elements in the steel enhances its hot hardness.
- OPRD has perfected a motion-transformer for converting rotary into reciprocating motion, or vice versa, which makes crankshafts, wrist pins and connecting rods unnecessary. Through reduction of the number of moving parts, weight per horsepower is said to be reduced to approximately two thirds that of conventional designs.
- A Barnesdril magnetic coolant separator has been found particularly advantageous in the production of precision ground and honed surfaces. The separator removes metal swarf and eliminates abrasive dust responsible for minute surface scratches.
- Metal parts can be run together without added lubrication if they produce sufficient oxide for lubrication. The higher the hardness of the metals, the less the tendency to gall, since seizing that may occur will tend to powder off instead of tearing a large area from either surface.
- Carburizing and sintering may be combined in a single operation in the preparation of iron powders. Increased compacting pressure and decreased carbursintering time develops improved properties and deeper cases, while special atmospheres and gas-tight furnace muffles are eliminated.
- Britain will ship about 2 million tons of food to Germany in 1946, according to official announcement.
- Meanwhile: British fat ration is being cut 1 oz weekly and the abandonment of dried egg imports is causing consternation.
- British government subsidies for new houses will be trebled. Capital value of a subsidy on a three-bedroom house will be \$2376.
- Fido, the wartime airport fog-disposal device, is being abandoned in England for peacetime operation. It's too expensive, the cost being about \$21,000 per hr for one airport, which works out about \$1718 for each airplane landed during foggy weather.
- British shipyards, now building 392 vessels totaling 1,612,810 gross tons, are busier than at any time since 1930.
- Scientific research to help British industry already costing private firms more than \$4 million a year in 30 cooperative laboratories is to be almost doubled in the near future.
- Cries of "waste" at home have stalled all dumping of unsalvageable material in the Pacific theatre.
- On Leyte there are thousands of truck rear ends, rusty motors, truck frames, broken jeeps and the like, but no one in authority has courage enough to have them dumped in the blue Pacific where they belong. Not worth shipping home for scrap, the only other alternative would be shipment to Japan's steel mills!
- Steep Rock mines in Canada plans to ship 1,000,000 tons of ore in 1946.

# Heat Treatment of High-Speed

**D**URING the past several years the heat treatment of high-speed steel has been the subject of considerable research. As a result, it may be said that a fairly comprehensive picture of the structural changes involved is now available. Certain general principles have been established which may be applied to all classes of high-speed steels. These principles are not only of academic interest, but are essential to the practical heat treater in order (1) that he may derive the full benefit of the inherent capabilities of his steels, (2) that he may be in a good position to design special treatments for attaining unusual properties, (3) that he may be adequately equipped to locate the source of trouble when it occurs, and (4) that he have the fundamental background to evaluate new types of prescribed treatments.

It is the purpose of this series of articles to present a summary of the modern picture of high-speed steel heat treatment with some emphasis on the practical aspects of the subject.

The nominal compositions of the principal high-speed steels are given in table I. No attempt will be made here to discuss the relative merits and specific

applications of the several grades. The background to these questions has been covered by Gill and his associates.<sup>1</sup> For the purposes of the present discussion, it is sufficient to say that all these steels undergo the same basic changes during heat treatment

<sup>1</sup> Gill, J. P., Rose, R. S., Roberts, G. A., Johnston, H. G., and George, R. B., "Tool Steels"—American Society for Metals, Cleveland, 1944.

and differ only in comparatively minor details. For example, all high-speed steels consist of ferrite and complex alloy carbides in the annealed condition; they are austenitized just below their melting points for hardening; and they are tempered to achieve secondary hardness.

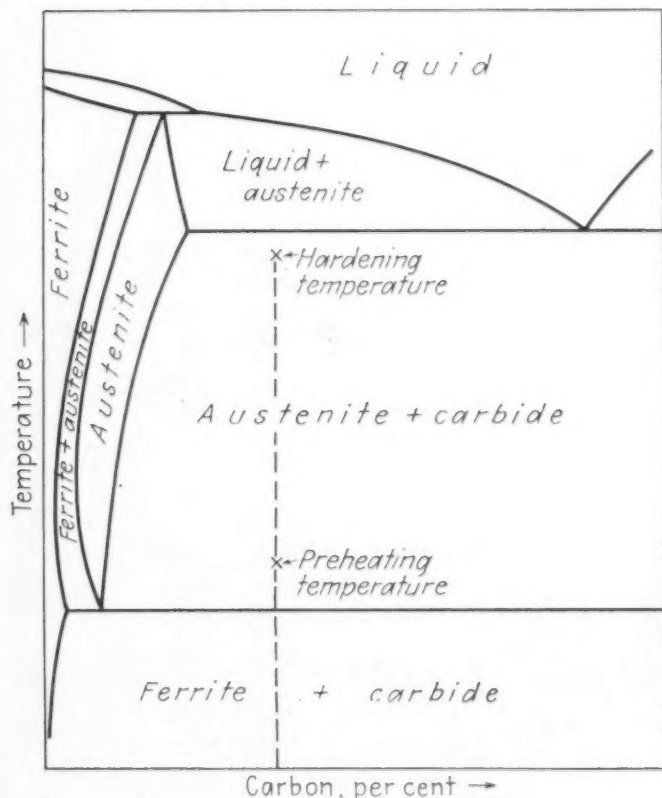
## Austenitizing of High-Speed Steel

In order to facilitate a clear understanding of the internal changes occurring during the austenitizing of high-speed steel a simplified phase diagram for high-speed steel is presented in fig. 1. The steel in the annealed condition at room temperature, as indicated by the diagram, consists of ferrite and alloy carbides. The microstructure of the annealed steel shows spheroidal carbide particles embedded in a ferrite matrix (fig. 2a). This annealed structure is important not only from the standpoint of machinability but also as an essential prior structure for the subsequent hardening treatment.

During the heating to the hardening temperature, two significant changes take place: The ferrite transforms to austenite and the carbides begin to dissolve in the austenite. At the hardening temperature, the phases present are austenite plus some undissolved complex carbides. It is general commercial practice to carry out this heating in two steps. The first step is a preheat at temperatures between 1300° and 1650°F, the upper part of this range being used except when the prevention of even slight decarburization is important. The reason for preheating is twofold: (1) To reduce the danger of cracking and warping as a result of thermal shock and transformational stresses accompanying the phase change from ferrite to austenite, and (2) to minimize the time of holding at the high heat temperature.

The second step in the heating consists of a soak at a temperature somewhat under the fusion point of the steel, which produces solution of the carbides in the austenite, and prepares the austenite for proper transformation during the subsequent cooling. Complete solution of the carbides is not attained, though the amount of carbide dissolved is directly dependent on the austenitizing temperature. This is illustrated in the photomicrographs of figs. 2b, c, and d, and graphically in fig. 3. The curve of fig. 3 shows the percent of undissolved carbide remaining in the

FIG. 1—Simplified phase diagram for typical high speed steel (Grossman and Bain).<sup>2</sup>





# Steel . . .

By MORRIS COHEN and PAUL GORDON  
Dept. of Metallurgy, Massachusetts Institute of Technology

**The modern practice of heat treating high-speed steels in order to obtain desired physical properties is summarized in this comprehensive article. In this first section of five parts, the authors introduce, with the aid of photomicrographs, background concepts of structural changes which occur as a result of varied heat treatments. An aid in controlling room-temperature structures in tungsten-molybdenum steel is also presented.**

tungsten-molybdenum grade of high-speed steel after quenching from several different temperatures, and reveals that as the austenitizing temperature is raised the amount of undissolved carbide in the steel decreases. In other words, more and more carbide dissolves in the austenite, thereby increasing the latter's carbon and alloy contents. An important and practical effect of the increased solution of carbon and alloying elements in the steel is the enhancement of the hot-hardness of the steel. This effect is represented for 18-4-1 steel by the curves of fig. 4, in which the hot-hardness values at 1050°, 1100° and 1150°F after hardening and tempering are plotted as a function of the austenitizing temperature. It is evident that from the viewpoint of hot-hardness alone, high austenitizing temperatures are desirable.

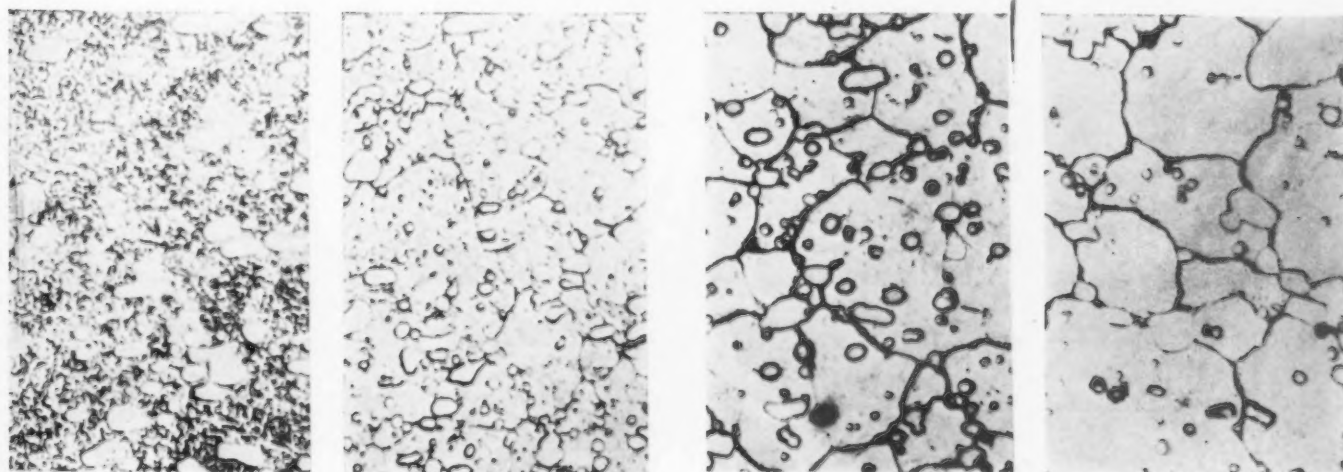
*For previous articles on heat treatment of tool steels, see THE IRON AGE, Oct. 8, 1942, Jan. 15, 1942 and Dec. 4, 1941.*

However, other important considerations limit the temperature and time of austenitizing. In addition to the danger of burning the steel, that is, causing incipient fusion at the grain boundaries, perhaps the chief limiting factor is the austenite grain size. The effect of both increasing temperature and time of austenitizing is to enlarge the austenite grains. This

may readily be seen in the curves of fig. 5 for 18-4-1 steel. At austenitizing temperatures of 2350°F and below, only the temperature exerts a major influence on the grain size, but above 2350°F the effects of both time and temperature are marked. The ultimate strength and toughness of the steel are related to the austenite grain size; in general, the finer the grains, the greater are the toughness and strength. An indication of this relationship is given in fig. 6, which shows the loss of plasticity in static torsion as a function of the grain size of 18-4-1 steel—the various grain sizes having been obtained by adjusting the austenitizing temperature. It has been shown<sup>a</sup> that the serious loss in plasticity is due primarily to the grain size and not to the different amounts of alloying elements dissolved. On the other hand, in applications where brittleness is not an important factor, high austenitizing temperatures are advantageous in improving cutting efficiencies, largely through the attainment of higher hot hardness as previously noted.

## Cooling From Austenitizing Temperature

**Transformation Curves**—A discussion of the cooling of high-speed steel from the austenitizing temperature cannot be based upon a diagram of the type



A—Annealed

B—Quenched from 2000°F

C—Quenched from 2200°F

D—Quenched from 2350°F

**FIG. 2**—Annealed and quenched microstructures of untempered 18-4-1 high-speed steel. Etched with aqua regia-glycerine. Magnification 2000X. (Grossman and Bain.)<sup>2</sup>

TABLE I  
Principal Grades of High-Speed Steel

Designation	W	Mo	Cr	V	C	
Tungsten (18-4-1)	18		4	1	0.5 to 0.8	may also contain cobalt
Tungsten (18-4-2)	18	0 to 1	4	2	0.8	
Tungsten-molybdenum	6.00	5.00	4	1.75	0.8	
Molybdenum-tungsten	1.50	8.50	4	1	0.75	
Molybdenum-vanadium		8.25	4	2	0.8	
High Carbon-high vanadium	5.75	4.75	4.25	4	1.25	....

TABLE III

Some Austenite-Bainite-Martensite Structures Obtainable in Tungsten-Molybdenum (6-5-4-1 $\frac{3}{4}$ ) High-Speed Steel<sup>6</sup>

Hot-Quenching		Structure at Room Temperature, Pct				Room Temperature Hardness, Rc
Temp., °F	Time, Hr	Excess Carbides	Bainite	Austenite	Martensite	
400	24.0	6	37	55	2	57.5
500	24.0	6	52	42	.....	57.0
600	0.5	6	18	54	22	59.5
600	2.0	6	40	54	.....	54.0
600	24.0	6	41	53	.....	53.0

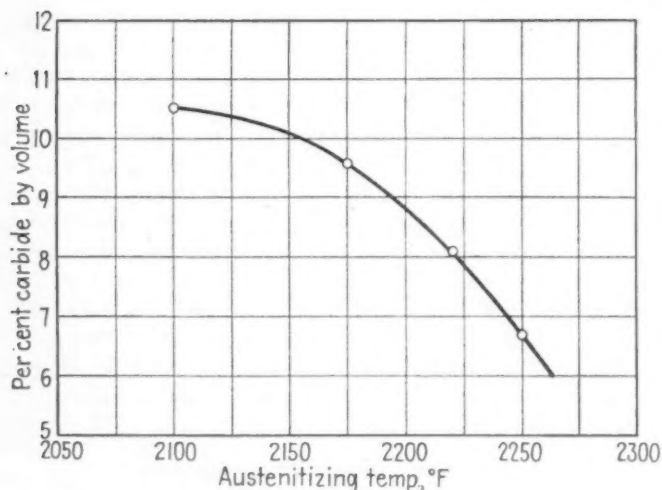


FIG. 3—Percent undissolved carbide in tungsten-molybdenum (6-5-4-1 $\frac{3}{4}$ ) high-speed steel as a function of austenitizing temperature.

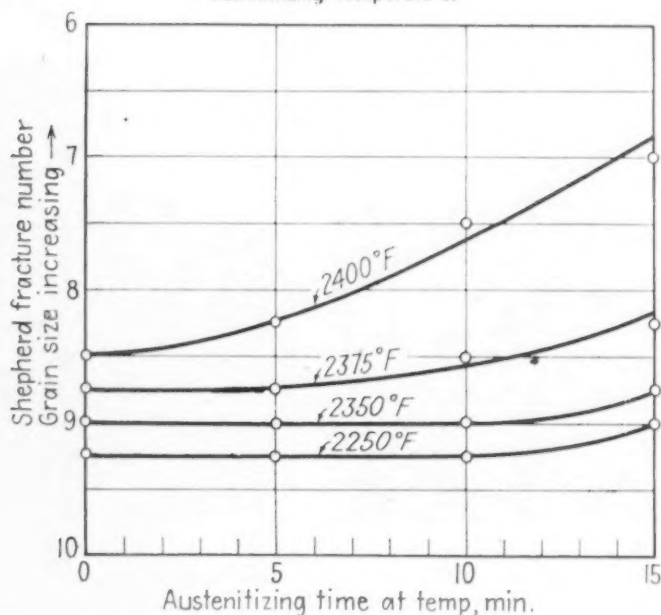
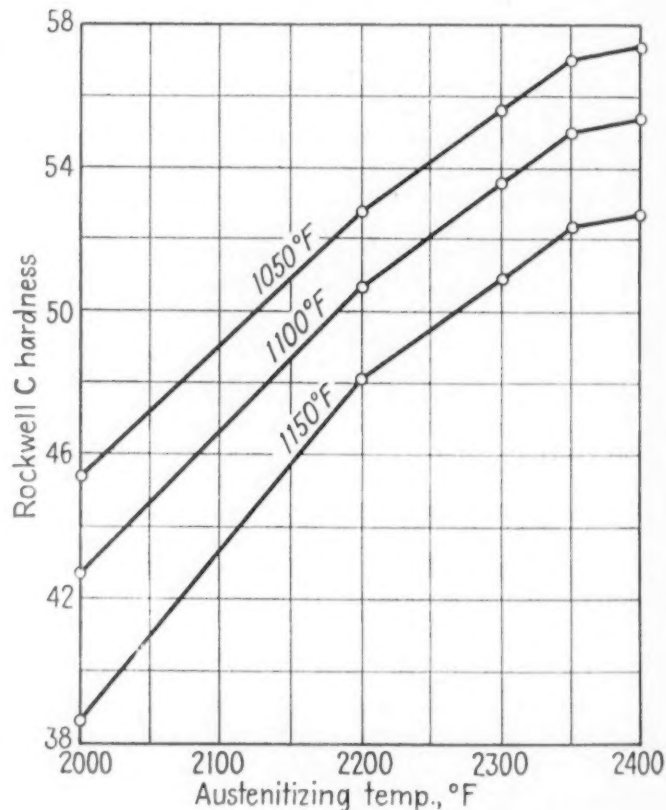


TABLE II  
Isothermal Annealing Treatments of High-Speed Steel<sup>7</sup>

Designation	Austenitizing		Transformation		Brinell Hardness After Anneal
	Temp., °F	Time, Hr	Temp., °F	Time, Hr	
18-4-1	1650	2	1400	4	255
5 $\frac{1}{2}$ -4 $\frac{1}{2}$ -4-1 $\frac{1}{4}$	1650	2	1400	4	217

given in fig. 1, for this represents the constitution of the steel under equilibrium conditions, whereas the usefulness of heat-treated tools depends upon the properties attained by avoiding the equilibrium transformations. It is, therefore, necessary to resort to the type of transformation curves illustrated in fig. 7 to describe the internal changes which occur during the cooling from the austenitizing temperature to room temperature. The curves of fig. 7 represent the isothermal decomposition of austenite in 18-4-1 steel after austenitizing at 2350°F. The data for this chart are obtained by quenching specimens of the steel very rapidly to specific temperatures below the critical temperature, holding for varying lengths of



ABOVE  
FIG. 4—Hot-hardness of 18-4-1 high speed steel at 1050°, 1100° and 1150°F as a function of austenitizing temperature. Steel hardened and tempered 2 $\frac{1}{2}$  hr at 1050°F before measurement (Desilets).<sup>3</sup>

LEFT  
FIG. 5—Effect of austenitizing temperature and time on the grain size of 18-4-1 high-speed steel (Schlegel).<sup>4</sup>



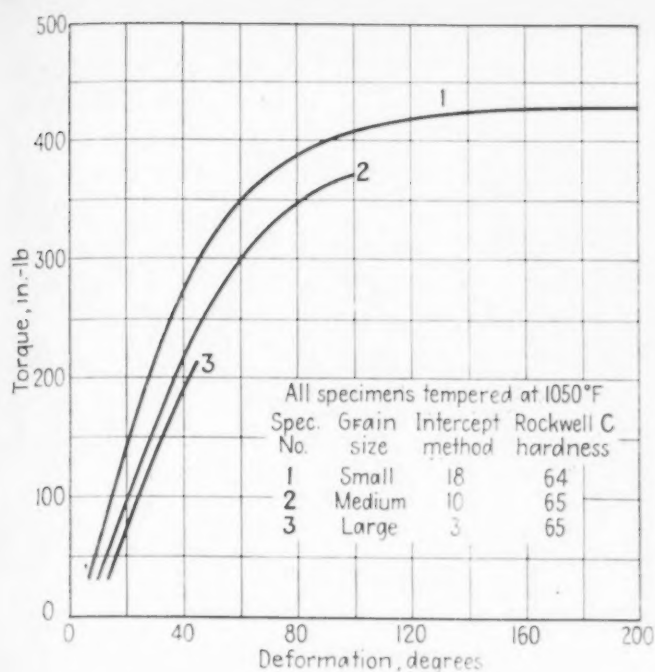
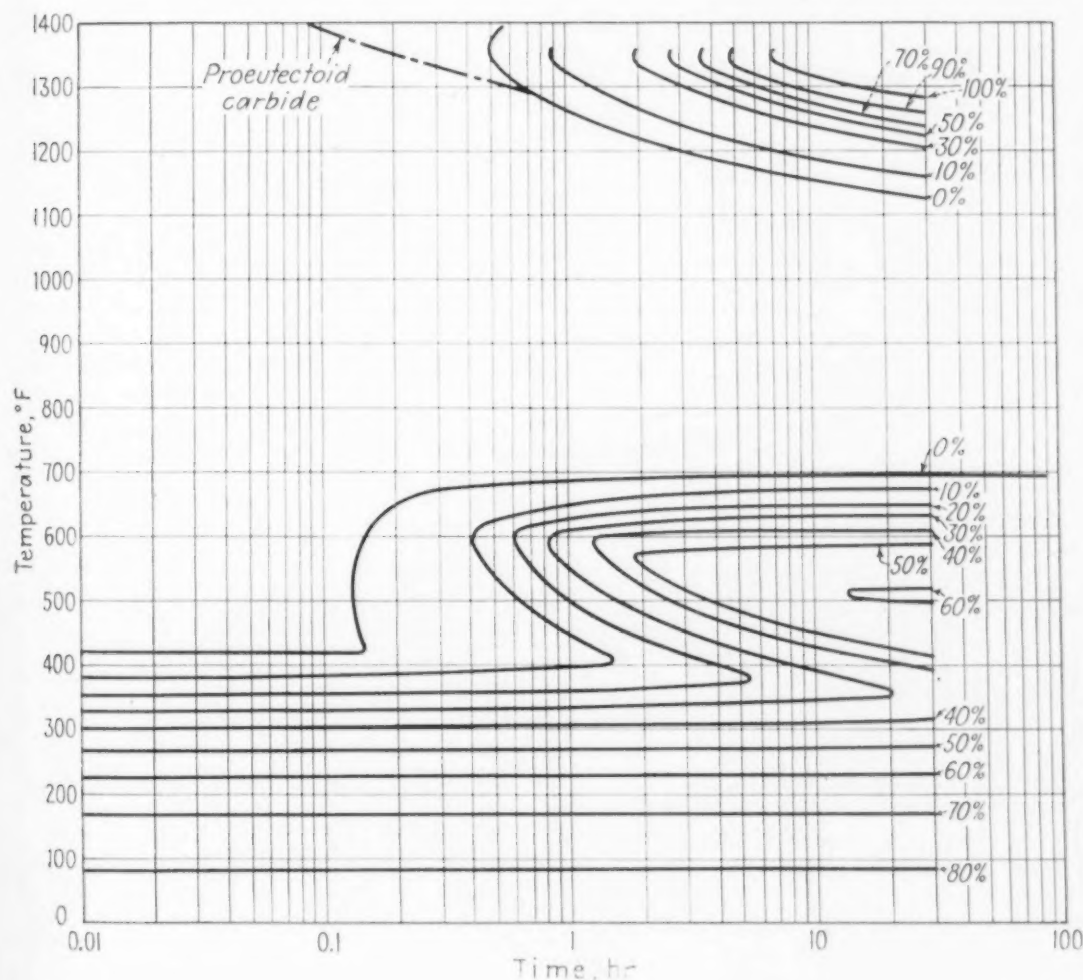


FIG. 6—Loss in plasticity accompanying increase in grain size in 18-4-1 high-speed steel as shown by static torsion tests (Gill).<sup>5</sup>

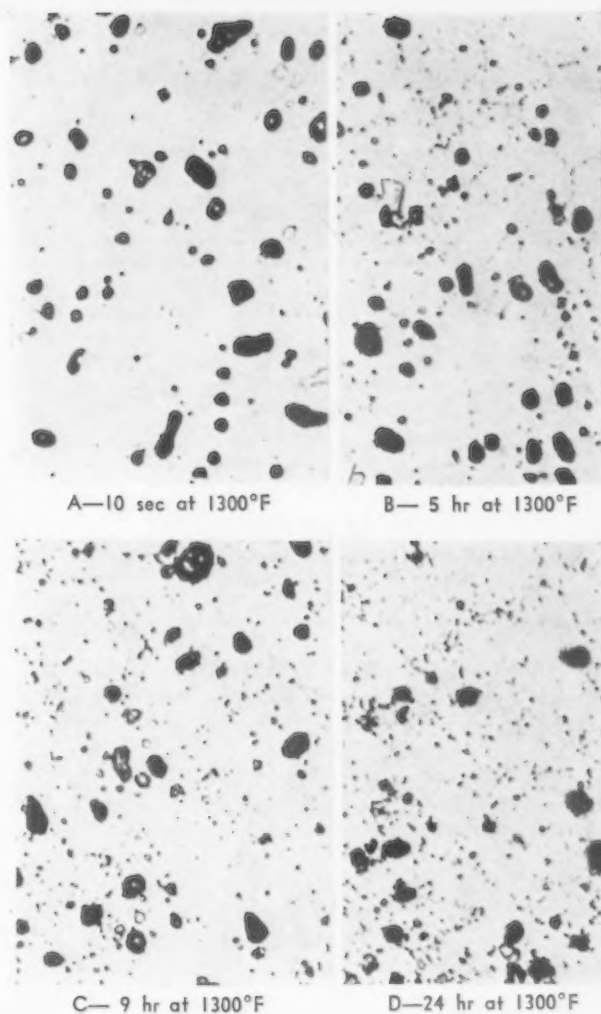
time, and observing the extent of austenite decomposition.

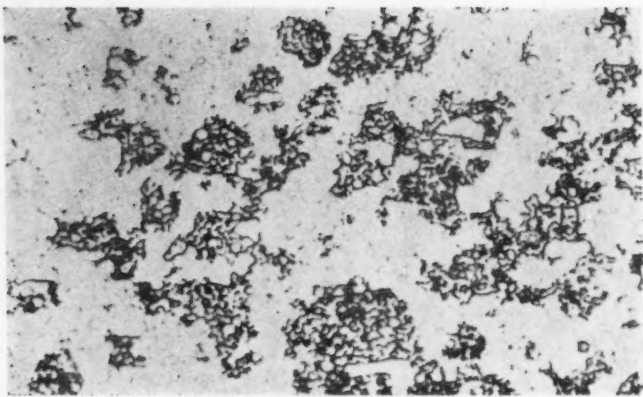
There are three general regions of rapid austenite decomposition. The first is represented by the upper set of C-curves in fig. 7 between temperatures of 1200° and 1400°F. Transformation in this region is



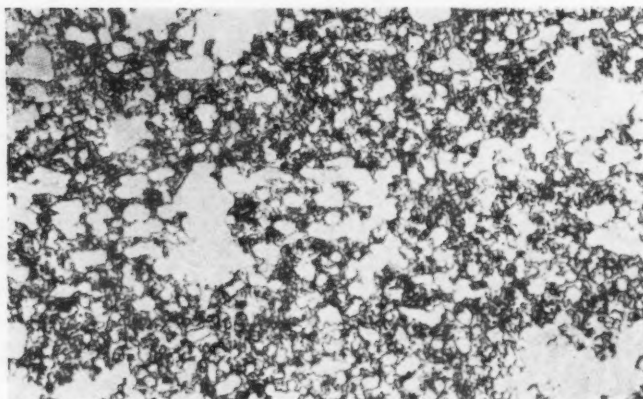
ABOVE  
FIG. 8—Proeutectoid carbide precipitation in tungsten - molybdenum (6-5-4-1 $\frac{1}{4}$ ) high-speed steel obtained by hot-quenching at 1300°F. Etchant, Murikami's reagent. Magnification 1000X (Gordon, Cohen and Rose).<sup>6</sup>

LEFT  
FIG. 7—Transformation curves for 18-4-1 high-speed steel (Gordon, Cohen and Rose).<sup>6</sup>





A—30 min at 1460°F, Rc=48



B—45 min at 1460°F, Rc=33

most rapid at 1350°F, at which temperature the austenite begins to decompose after 30 min of holding. At temperatures above 1300°F the austenite decomposition is preceded by grain boundary precipitation of carbides. The second region of austenite ac-

<sup>2</sup> Grossman, M. A., and Bain, E. C., "High-Speed Steel,"—John Wiley & Sons, Inc., New York, 1931.

<sup>3</sup> Desilets, R. A., "Hot Hardness Characteristics of High-Speed Steels,"—M.S. Thesis, M.I.T., 1943.

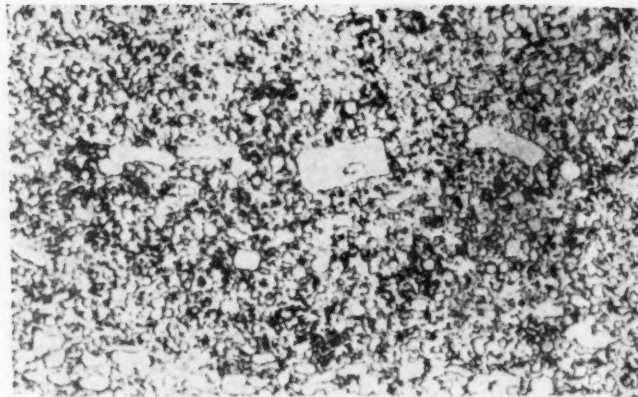
<sup>4</sup> Schlegel, W. A., "Surface Carbon Chemistry and Grain Size of 18-4-1 High-Speed Steel,"—Trans. ASM, 29, 1941, p. 541.

<sup>5</sup> Gill, J. P., "High Speed Steel, Carbide Segregate and Grain Size,"—Trans. ASM, 24, 1936, p. 735.

<sup>6</sup> Gordon, P., Cohen, M., and Rose, R. S., "The Kinetics of Austenite Decomposition in High-Speed Steel,"—Trans. ASM, 31, 1943, p. 161.

tivity lies between temperatures of 420° and 700°F, and is represented by the lower set of C-curves in fig. 7. At 500°F the austenite begins to decompose after only 8 min of holding. The third range of rapid austenite decomposition occurs below 420°F and is indicated by the horizontal lines in the lower portion of fig. 7.

Similar charts can be constructed for the other grades of high-speed steel. The general shapes and salient features of these charts would be the same as that given for 18-4-1 with but small differences in the actual temperatures and times of transformation. As an example of how the charts may be used, suppose that a piece of 18-4-1 steel is quenched from 2350°F to 1300°F, and then held at the latter temperature. The curves tell that decomposition of the austenite will begin after 40 min of holding, will be half-finished after 5 hr, and will be complete after about 15 hr. Similarly, for a sample cooled rapidly



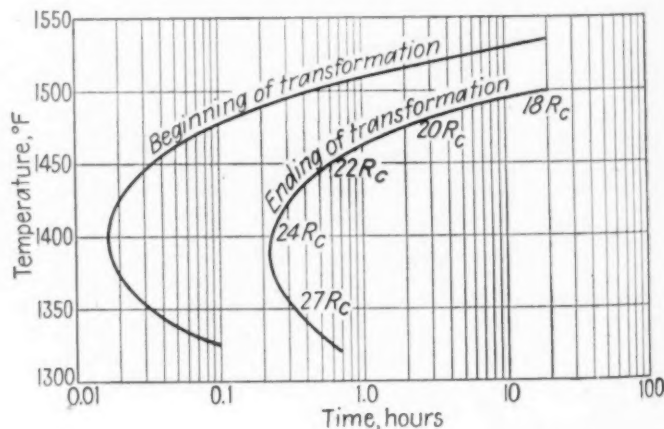
C—3 hr at 1460°F, Rc=21

FIG. 10—Microstructures of isothermally annealed 18-4-1 high-speed steel; etchant nital. Magnification 1000X. Austenitized 1 hr at 1650°F, held at 1460°F and water quenched. (Payson).<sup>7</sup>

to, say, 500°F, decomposition of the austenite begins in about 8 min and is 60 pct complete after 20 hr. If a sample is continuously cooled at a rate rapid enough to carry the steel past the two "nose" regions without transformation, the curves indicate that decomposition of the austenite during cooling will begin at 420°F and be about 80 pct complete at room temperature.

**Spheroidite Formation**—While the transformation curves in fig. 7 are commonly called S-curves, they are more accurately described as consisting of two families of C-curves with the upper part of the first family preceded by proeutectoid carbide precipitation and with the lower part of the second family intercepted by a set of essentially horizontal lines. The transformation represented by the upper C-curves goes to completion in a regular manner if the holding time is sufficiently prolonged. The product is a spheroidal aggregate of ferrite and carbide (spheroidite) having a relatively low hardness. Above 1300°F, transformation of the austenite is preceded by the precipitation of carbides preferentially at the austenite grain boundaries (fig. 8). Such carbide precipitation may have an adverse effect on the strength properties, (although not necessarily on all the performance properties), of tools. It is well therefore to appreciate the possible occurrence of such carbide

FIG. 9—Austenitizing temperature may be much lower than that used when steel is to be hardened. The C-curves shown here lie much further to the left than those shown in fig. 7, and the transformation times are relatively short.





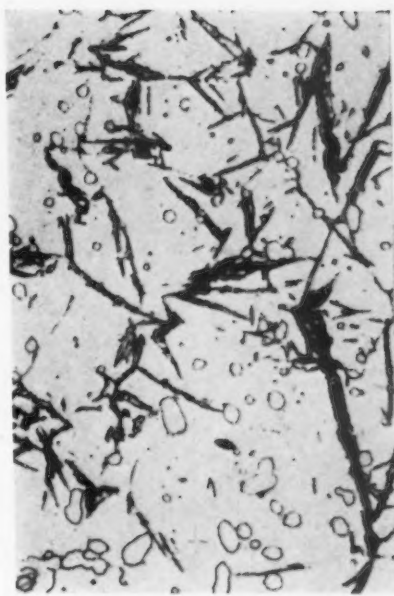
precipitation, particularly in connection with the common practice of hot-quenching high-speed steel into the range of 1000° to 1200°F as a part of the hardening operation. The grain boundary carbide precipitation may be avoided by keeping the temperature of the hot-quenching bath below 1200°F.

A practical result of the study of the austenite decomposition process in the range of spheroidite formation is the development of isothermal annealing of high-speed steel at subcritical temperatures.<sup>7</sup> Conventional annealing practice involves very slow cooling from above the critical temperature. The need for such time consuming cooling is eliminated by the use of subcritical isothermal annealing. The steel is simply heated to the appropriate austenitizing temperature, cooled as rapidly as feasible to the transformation temperature, in the range of the upper family of C-curves, held there for the proper length of time and then cooled at any convenient rate to room temperature. The austenitizing temperature may be much lower than that used in the case when the steel is to be hardened, inasmuch as it is necessary merely to produce an austenitic structure in the steel without regard to dissolving any great amount of carbide. For this reason, the corresponding C-curves, illustrated in fig. 9, lie much further to the left than those shown in fig. 7, and the transformation times are relatively short. In general, it is sufficient to austenitize at a temperature about 100°F

<sup>7</sup> Payson, P., "The Annealing of Steel,"—Crucible Steel Co. of America, New York, 1943.

above the critical. The choice of the isothermal decomposition temperature depends mainly on striking a balance between the final hardness desired and the time to be allotted for the production of the annealed structure. Transformations just below the critical temperature produce softer structures, but require considerably longer times than those at temperatures perhaps 100° to 200°F below the critical. Considerations such as these lead to the treatments, table II, for the isothermal annealing of the tungsten and tungsten-molybdenum types of high-speed steel.<sup>7</sup> An indication of the microstructure and hardness produced by such treatment is given in fig. 10.

**Bainite Formation**—The austenite transformation corresponding to the lower C-curves in fig. 7 exhibits several unique characteristics. The product of the reaction is bainite, a fine needle-like structure quite distinct from the well-known acicular martensite structure. This distinction may be readily observed



A—Held 10 sec at 330°F; shows martensite formed during the cooling to 330°F.



B—Held 24 hr at 330°F; shows the original martensite as in (a) plus fine bainite needles formed isothermally.

FIG. 11—Martensite and bainite in tungsten-molybdenum (6-5-4-1¼) high-speed steel obtained by hot-quenching to 330°F and then tempering 5 sec at 1050°F before cooling to room temperature. (The 1050°F temper serves merely to cause the transformation products to become dark etching.) (Gordon, Cohen and Rose).<sup>6</sup>

in the photomicrographs of fig. 11. The transformation of austenite to bainite does not go to completion; it stops even though there is much austenite available for further decomposition. For example, in the tungsten and tungsten-molybdenum grades, 55 to 60 pct of bainite is the most that can be formed isothermally. Yet the bainite transformation actually starts considerably sooner than does the upper C-curve transformation. Furthermore, the austenite which remains after bainite formation has stopped is remarkably stable, for it undergoes no further decomposition upon subsequent cooling all the way to room temperature and even, in some cases, to sub-zero temperatures.

By means of hot-quenching in the bainite range, it is possible to obtain relatively stable room-temperature structures which, in addition to excess carbides, consist of bainite, austenite, and martensite in controllable proportions. Little information is as yet available concerning the physical properties, or even the tempering of such structures. Further research, however, may reveal many practical applications of these structures, particularly for tools and dies requiring high impact resistance. As an example of the variety of austenite-bainite-martensite structures obtainable and their room-temperature hardnesses, some data for the tungsten-molybdenum grade of high-speed steel are listed in table III.<sup>8</sup>

*Next week the authors continue their discussion of isothermal cooling curves, and also introduce the role of tempering and its relation to secondary hardness.—Ed.*

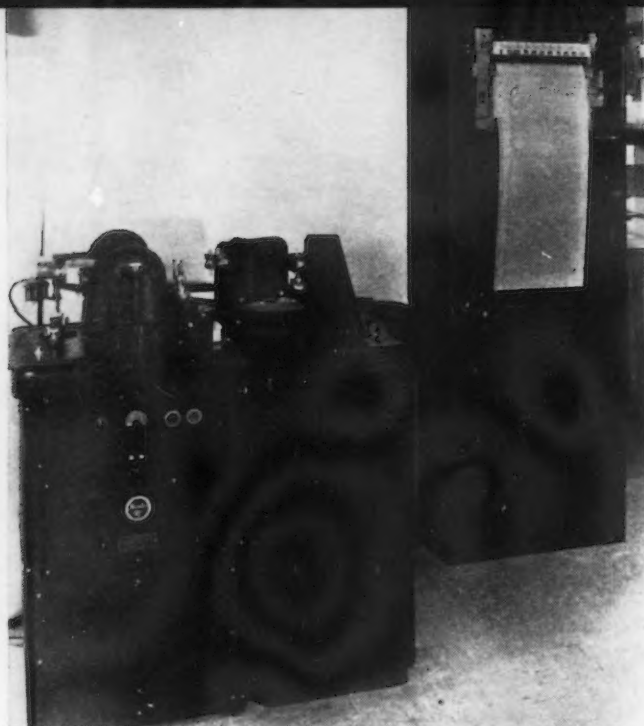


FIG. 1—Norelco Geiger counter X ray spectrometer complete with automatic recorder.

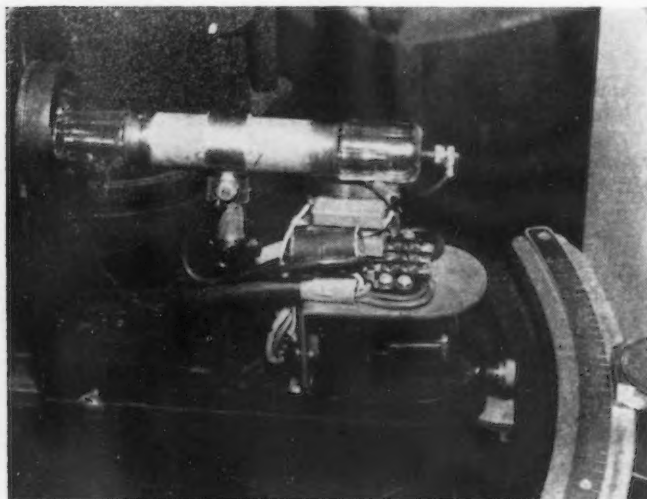


FIG. 2—Close-up view of the goniometer or analyzer of the spectrometer.

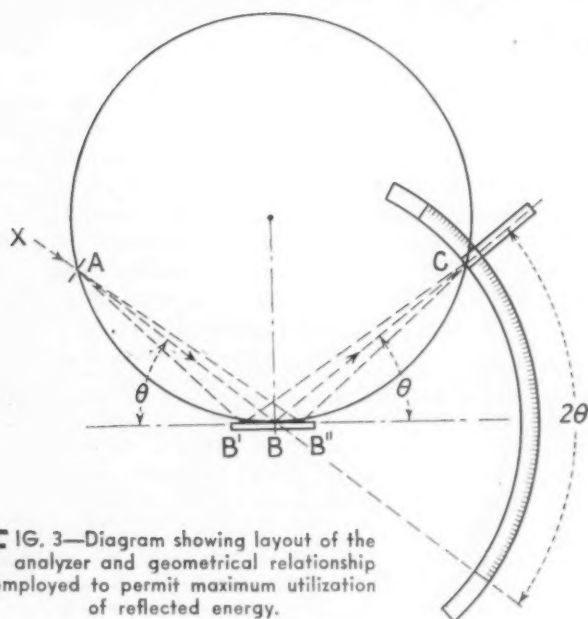


FIG. 3—Diagram showing layout of the analyzer and geometrical relationship employed to permit maximum utilization of reflected energy.

# Geiger Counter

By E. S. KOPECKI

Associate Editor, *THE IRON AGE*

THE development of the Geiger-counter spectrometer by the North American Philips Co., Inc., has made it possible to make quick and accurate measurements of the intensities of X ray reflections. This is especially important because except for alloys and other solid solutions whose spacings depend on composition, X ray diffraction has mainly been used for the qualitative identification of crystalline compounds. Relative amounts of these compounds in a mixture determine the relative intensities of the X ray lines, but it has not often been feasible to make quantitative analyses in this way because the intensity determinations have been too elaborate and time-consuming. Such determinations have been either estimates of photographically recorded intensities or measurements with ionization chamber spectrometers. X ray photometry is a slow affair and at best gives results which are of only limited accuracy. Ionization

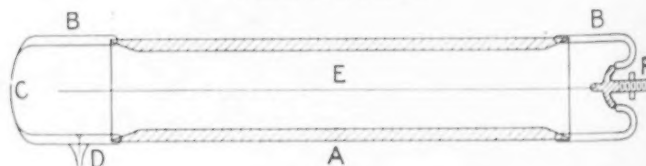
For other articles on Geiger counting tubes, see *THE IRON AGE*, Nov. 1, 1945, and June 10, 1943.

chamber methods have been too complex for anything but fundamental research on the properties of X rays and crystals.

Improvements in Geiger-counter tubes change this situation by making measurements of X ray intensities simple and rapid, in that the X ray intensities and diffraction angles are measured directly without intermediate photographic steps and also that it is simple enough for unskilled operators to perform the routine industrial tests. The Philips instrument incorporates such tubes and their attendant circuits into a spectrometer accurate enough for most applications. With it, X ray intensities can be determined with equal or better accuracy and in a small fraction of the time required by the earlier procedures.

This ability to make intensity measurements quick-

FIG. 4—Schematic sketch of Geiger counting tube and essential components.





# Used in Powder Metallurgy

**The Geiger-counter spectrometer is steadily gaining prominence in the chemical and metallurgical industries as a valuable laboratory instrument. Qualitative and quantitative analyses are accomplished in much less time than with other methods and instruments now in common usage, mainly due to the fact that X ray intensities and diffraction angles can be measured directly, without intermediate photographic steps. This article deals with the use of the spectrometer in the field of powder metallurgy, a field that has benefited greatly from the development of this instrument.**

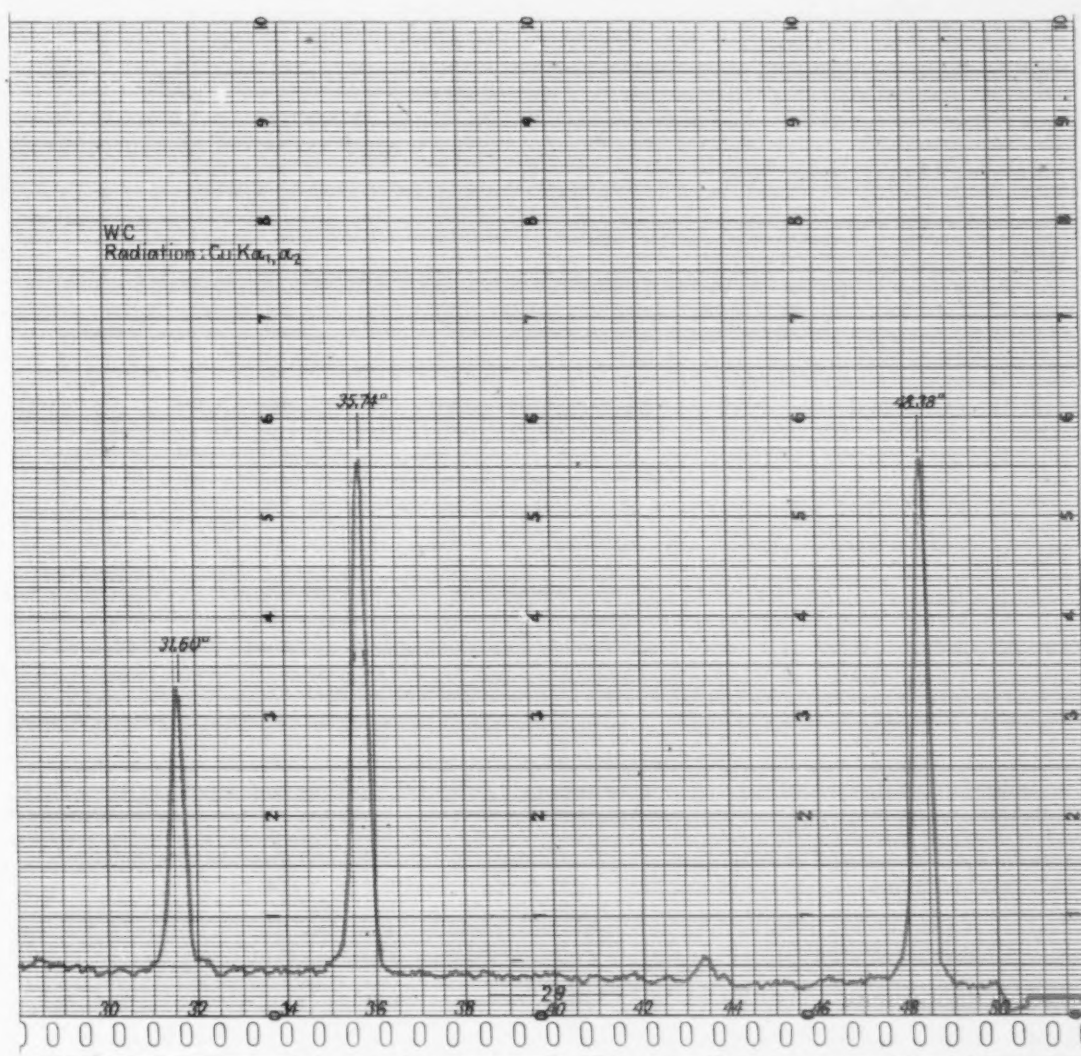
ly and easily opens new classes of problems to X ray analysis. In suitably calibrated systems, crystalline compounds can be recognized and their relative amounts established in a very few minutes. Inevitably such a rapid method of analysis will find many plant and laboratory applications.

An outstanding use of the multitude of uses to which this equipment has already been put, is its importance in the field of powder metallurgy. At the

Latrobe, Pa. plant at Kennametal, Inc., the spectrometer has become an important factor in the laboratory control of the cemented-carbide products being produced there.

The spectrometer in use at Kennametal is illustrated by fig. 1. The pulses received from the Geiger counter are conditioned by electronic circuits and fed into a frequency meter circuit arranged to drive a suitable indicating meter whose deflections indicate the loca-

FIG. 5 — Standard pattern of 100-pct tungsten carbide.



tions and intensities of lines as scanned. For highly precise work an electromechanical counter, with a timing element, is supplied. Accuracy is improved through spreading the pattern over a larger linear distance than is possible with the conventional film camera. Intensities can be read directly without employment of a densitometer and the difficulties attendant upon film response characteristics and proc-

C the receiving slit on the Geiger counter housing. Distances AB and BC are kept equal. To maintain proper angular relationship, the specimen must be rotated at half the angular speed of the Geiger counter. Scanning and recording can be made automatic, by driving the gear on the vernier at a constant rate with a synchronous motor mounted to the scanning arm.

The high sensitivity of the Geiger counter lies in its

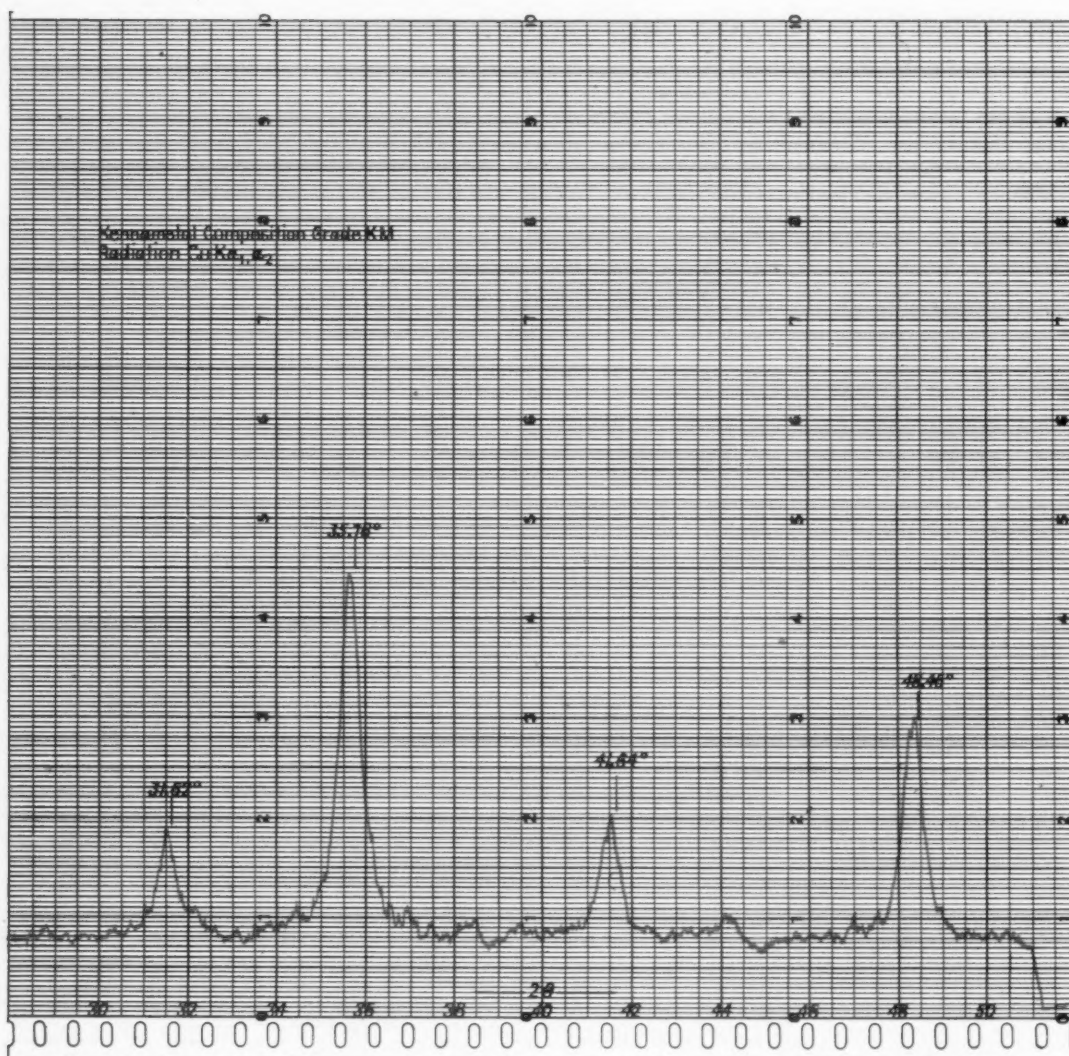


FIG. 6—Spectrometer pattern of cemented carbide, Kennametal composition grade KM.

essing are eliminated. In addition, single peaks can be studied rapidly. The operation is simplified so that relatively unskilled personnel can prepare specimens, insert them in the spectrometer and subsequently remove the record chart.

The goniometer or analyzer, fig. 2, consists of a Geiger counter mounted on a graduated arm and so arranged as to rotate concentrically about the specimen, picking up the various diffracted beams. To obtain maximum utilization of reflected energy and to improve precision, the geometrical relationship illustrated by fig. 3 is utilized. Since reflections from crystalline materials are critical (occur at certain fixed angles only) a divergent beam from a source A impinging upon a specimen located at B' - B - B'' would result in the reflected beams converging and reaching a focus at C, providing A, C and all parts of the specimen lie on a circle drawn through points A, B' - B - B'' and C. Applied to X ray spectrometry, A becomes the X ray beam source, B' - B - B'' the specimen holder and

ability to detect individual quanta of radiation. The formation of a single ion pair anywhere within the active volume of the counter tube releases a flow of current large enough to operate a relay directly.

In its simplest form, a Geiger counter consists of a coaxial wire and cylinder. The electrodes are usually enclosed in a glass envelope containing a suitable gas mixture at a small fraction of atmospheric pressure. The passage of ionizing radiation triggers a momentary discharge and develops a voltage pulse at the capacitor. Following the discharge, the counter recovers quickly to its original condition and is ready to detect the next ionization. The schematic sketch shown in fig. 4 well illustrates this instrument, and shows it to consist essentially of a stainless-steel cylinder "A" to the ends of which are sealed glass tubes "B." One end of one glass tube is sealed off by a thin window "C" made of Lindemann glass that has a high transmissibility for soft X rays. The other end of the counter is sealed off and has a metal insert "F" that carries



a tungsten wire "E," which is about 0.035 in. in diam and is situated concentric with the length of the tube. A seal-off tube is provided at "D" for filling the counter. A number of gases have been employed as a filling for the tube and the most successful for X ray work have been a mixture of a rare gas such as argon or krypton and an organic vapor. The organic vapor makes the counter a so-called fast counter by acting as an internal quench for the discharge inside the tube after an event.

The Kennametal laboratory is rapidly turning to the spectrometer for use in its development work and production checking for quantitative as well as qualitative means of identifying compositions, since chemical analysis does not give information on compounds, which is of vital interest. The Geiger counter has cut analysis time from two days for chemical analyses, and one day for X ray methods using film, to 35 min. Further, resolution and sensitivity of the patterns are much better than the film methods and can be more easily interpreted. The specimens examined are used in the form of (1) solid pieces of carbide, (2) powder, or (3) complete tool shank and bit mounted so as to obtain inspection of the area desired.

The first step in the use of the spectrometer is to build up an extensive library of standard patterns. For example, fig. 5 illustrates the pattern representing 100 pct WC. The inflections and their intensity

values at the various angles (2—) in degrees, are characteristic of the compound WC (100 pct). When this compound appears in materials where it constitutes less than 100 pct of the composition, the WC inflections will always occur at the same angle values, but the intensity will vary depending upon the percent of WC present. For example, in fig. 6, the Kennametal composition Grade KM (actual composition not given) contains, among other compounds, WC, as represented by the inflections at 31.6, 35.7 and 48.4 degrees. The intensities can be compared with those of the corresponding degree values of fig. 5, and the percent WC can be quickly and quite accurately estimated. The inflection, fig. 6, at 41.64 degrees, indicates the presence of another compound, and is identified by comparison with a standard of that compound.

The development of the spectrometer has given new impetus to the relatively new field of powder metallurgy, in that analysis procedures available to date have been inadequate for properly identifying non-homogeneous structures. With this new instrument in hand, great strides in developing powder metallurgy techniques can be expected.

#### Acknowledgment

The author gratefully acknowledges the expert opinions of R. G. Wyckoff, senior scientist (R), U. S. Public Health Service, Bethesda, Md., in the preparation of this article.

## Carboloy Dies Increase Die Life

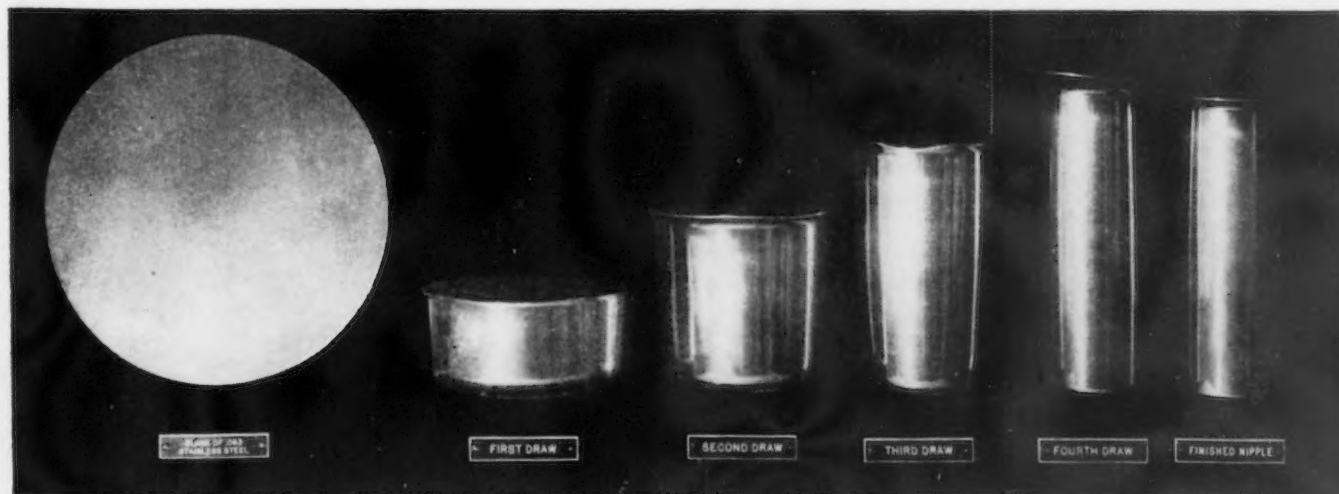
**G**AINS in die life ranging from 10 to 1, to as high as 20 to 1 by the use of cemented carbides for three out of the four dies used on a certain forming operation on stainless steel are reported by the Neubart Stamping & Mfg. Co., Los Angeles.

The process is rather unusual since there is a small reduction in wall thickness of the stock through the operations. In producing the sleeves, a stainless steel blank 0.063-in. thick and 9-in. diam is first formed into a cup, 5½-in. in diam. The next three operations, performed with dies having Carboloy nibs, reduce the OD of the sleeve successively to 4 in., 3 in.,

and finally to 2¾ in., as shown in the accompanying illustration.

Production figures show that the various types of high production steel previously used produced between 500 and 1000 pieces, on an average, before regrinding. The Carboloy dies regularly turned out between 5000 and 10,000 sleeves to required finish and dimensional tolerances before the dies had to be re-polished, effecting a material saving in die maintenance and also increasing to some extent the effectiveness of the presses by decreasing the down time necessary for changing dies.

**V**ARIOUS steps in drawing a stainless steel nipple from the blank to the finished part. After the first cupping operation, the next three draws are performed with carboloy dies.



By WILLIAM F. SCHLEICHER  
*Porter-Cable Machine Co., Syracuse*

## Wet-Belt Machining

**R**ADICAL in many of its applications, and in some instances altering the procedure of production from the drafting board to the finished piece, wet-belt machinery has proved to be a fast, economical method of grinding, surfacing and stock removal. The novel and ingenious fixtures which industry has constructed, and the large variety of ferrous and nonferrous products which have been surfaced and ground, are evidence of its versatility and its adaptability to a wide variety of grinding and surfacing operations. Fig. 1 shows a representative collection of parts surfaced on a wet-belt machine.

Belt machining is not new. Wood and composition materials have been dry belt machined for years. The major drawback contributing to a rejection of belt machines as machine tools, was the fact that the heat generated by dry-belt machining caused

distortion, warping, discoloration, and weakened the structure of many types of materials: glass, ceramics, plastics and tempered metals. With dry-belt machines the classes of materials which could be machined were rigidly limited. The nonexistence of abrasive belts which were impervious to coolants, and possessed grits strong and sharp enough to surface hardened materials, formed another barrier which had to be overcome before belt machining could be admitted into the family of machine tools.

A cloth, plastic-bonded belt was perfected, impervious to water and soluble oils. Aluminum oxide and silicon carbide grits, toughest and most durable abrasives on the market, were electrostatically bonded to the belt. Machines, equipped with recirculating tanks, strainers, platens; automatic feed tables were perfected by the Porter-Cable Machine Co., and the highly efficient, fast and accurate wet-

**FIG. 1**—A representative group of small cast iron, steel, aluminum, and bronze parts finished by wet-belt machining. The aluminum ball was finished on a 2-in. wide belt with a resilient platen.





**For surfacing and stock removal on all types of material, the new technique of wet-belt machining offers speed, efficiency, and extreme accuracy. Surfaces machined may be flat, convex, or concave, and limits of accuracy of 0.0005 in. can be held without difficulty by the use of simple, inexpensive fixtures. For less accurate work hand operations may be performed.**

belt machines were placed in immediate operation during the late war years when speed and production were urgent.

A coolant of 1 part soluble oil to 30 parts water is applied to the belt directly above the work. Both work and belt are constantly cool, eliminating any danger of frictional heat. There is no warping, discoloring or weakening the structure of tempered metals or materials of low fusion points such as glass, ceramics, or plastics. A spray nozzle is buried inside the machine and constantly flushes the chips, which resemble chips from a shaper, out of the belt after the cutting operation. A clean, sharp cutting surface is assured at all times, and loading, which might impair the accuracy of the surfacing operation, is completely eliminated.

The dissipation of heat by the coolant enables the operator to remove stock, grind, and surface free-

hand without the benefit of expensive jigs and fixtures. Fig. 2 demonstrates freehand surfacing of connecting rods on a small wet-belt machine. Free-hand operation is particularly adaptable to flat surfacing where a close tolerance is not required. Chamfering, squaring and rounding operations in tool-rooms and die shops, repair and maintenance departments, and removing flashing, sprues, risers, burrs, and tool marks, lend themselves admirably to free-hand performance.

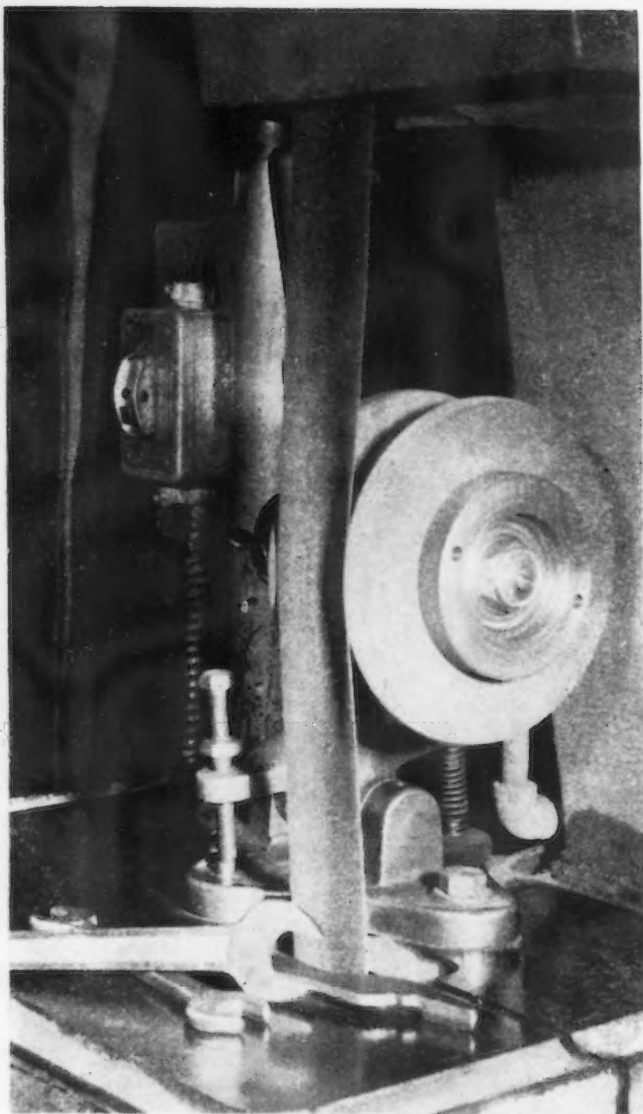
The coolant is not the only factor contributing to the advantage of free hand surfacing. Because the belt travel, or cutting pressure, is down, and the work pressure is into the belt, there is no danger of belt pulling the work out of the operator's hand. When flat surfaces are ground, or contours of a piece are followed, and accuracy is not a requisite, the necessity for holding devices to hold the pieces

**FIG. 2—**Free hand surfacing of connecting rod faces. No holding devices are required when flat surfacing, and when exceedingly close tolerances are not necessary.



**FIG. 3—**Simple angle plate fixture used for surfacing a cast iron valve plate. Note the two pins just above the center of the workpiece which are all that is required to hold it in position.





**FIG. 4**—An ordinary metal pulley used as a platen. Note how the belt follows the contour of the pulley. The workpiece is convex and will fit snugly into the curve thus formed.

rigidly in place, is absent. In many instances holding devices are essential for the surfacing of irregularly shaped pieces, or where a high rate of production can be attained if, by means of a holding device, more than one piece can be surfaced at the same time. Such holding devices will be discussed later.

An important feature of wet-belt machining is the possibility of surfacing large, flat areas. The surfacing of 16 sq. in. is not uncommon. Fig. 3 shows the surfacing of a valve plate measuring 52 sq. in. Such large areas, however, are rare. The area which can be profitably surfaced is dependent on the material and the amount of stock to be removed. Generally speaking, aluminum and other nonferrous metals and some kinds of ferrous metals permit larger areas to be surfaced than hardened steels.

There is a definite limitation on the amount of stock which can be removed by this method. In some instances, as is the case with other machines, the use of wet-belt machining, must be indicated on the designing board. Whereas  $\frac{1}{8}$  to  $\frac{1}{16}$  in. is allowed for stock removal by a milling or other machine, only  $\frac{1}{32}$  in. is necessary when the same operation is performed by the wet-belt method. While more

than  $\frac{1}{32}$  in. can be removed, belt life is shortened, cutting time is lengthened and the full benefits of the method are not attained.

Large, flat area surfacing is made possible by the air-cooled steel platen over which the belt passes as it comes down. The standard platen is 9 in. wide by 12 in. high and absolutely flat and accurate. A hardened steel platen is necessary when holding exceedingly close tolerances or when establishing flat surfaces and/or parallelism. The platen is lubricated by the coolant to facilitate belt movement and prevent the possibility of shortening belt life through friction. The coolant further contributes to the adhesion of the belt to the platen and there is no uneven or bumpy belt travel over the platen which might adversely affect accuracy. Resilient platens with plenty of "give" are indicated when the surface to be ground is concave, when flatness is not an issue or when a high polish is desired. The grinding of concave surfaces is made possible because the belt will follow the contours of the platen if this is the same shape as the surface to be ground. Various models of wet-belt machines are available for contour grinding with belt widths as narrow as 1 in. For these models an ordinary pipe will serve as a platen. The belt will follow the OD of the pipe, making it possible to press the concave work into the belt and platen for the surfacing and stock removal operation. See fig. 4 which shows a wheel used as platen to grind a convex surface.

#### Many Different Holding Devices

While many operations can be performed free hand, manufacturers have perfected many different kinds of holding devices which speed production by holding anywhere from two to ten pieces which are surfaced at the same time. Some oddly-shaped pieces cannot be surfaced freehand but require a holding device.

These holding devices may be simple or complicated. Fig. 3 shows a jig in use at the Holmes Mfg. Co., Ithaca, N. Y. Several points are worthy of note in connection with this company's use of wet-belt machining. It had been the practice to mill this cast iron, 52 sq. in. valve plate. The finish thus obtained was unsatisfactory. The job was then placed on a wet-belt machine. A No. 80 belt removed 0.003 to 0.005 in. of stock, and a No. 180 belt supplied the finish to exact specifications. Tolerance was  $\pm 0.001$  in. over the entire 52 sq. in. Rejects were materially reduced and production increased 30 to 35 pct.

The jig used at the Holmes Co. is relatively simple. Simple fixtures are the rule rather than the exception. Another example of a jig, this one not so simple, is in use at the Thompson Products Co., Cleveland. See fig. 5. Connecting rods and caps are being finished by the operator with the use of a holding device. Rods are ground to approximately 0.001 in. flat, realizing a perfect circle. The value of wet-belt machining is often determined by the ability of tool engineers to design holding devices for pieces which at first glance would seem to be unfitted for it.

The newness of this method of grinding and surfacing, and the absence of precedents, from the standpoint of previously used fixtures, contributes to the need for a careful investigation into the possibilities of wet-belt machining before definite commitments are made to place the work and the operation on another machine. One misconception about wet-



belt machining is the belief that only those operations are performed on the wet-belt machines which cannot be performed on any other machine. The greatest savings and increases in production have resulted from the application of this method to operations formerly finished on orthodox machines. It is not the answer to the problem of a specific method to perform difficult operations, but an answer to the problem of performing grinding, surfacing and stock removal operations faster and better.

#### Automatic Feed Table

Two major requirements for efficient platen grinding and surfacing are:

- (1) A method of supplying sufficient work pressure into the belt for maximum cutting efficiency with a minimum of operator fatigue; (2) A mechanical aid to control the amount of stock in-feed into the belt to obtain close accuracy.

With the automatic feed table, perfected by the Porter-Cable Co., a pressure of 450 lb can be brought to bear into the belt. This is maximum, not work pressure. The amount of work pressure is dependent on the surface of the work to be ground, the area and the material. On all but the softest materials, low speed with adequate pressure will usually provide better results than high speeds and inadequate pressure. On harder materials the mechanical feed obviates operator fatigue which results when the operator performs free hand. A tolerance of 0.0005 in. can be held with the help of the automatic feed table.

This mechanical means of applying pressure permits the removal of stock up to  $\frac{1}{8}$  in., although  $\frac{1}{32}$  in. has proved to be the fastest and most efficient.

The table is equipped with a hydraulic control, regulating the rate of feed of the work against the belt. A micrometer stop disengages the feed when the desired amount of stock has been removed. Automatic table operation is almost foolproof and eliminates the use of skilled operators. The table can be moved to the right after the operation to facilitate loading and unloading away from the moving belt.

On standard tables a T slot is provided to hold angle plates, back-up bar or fixtures. On the production line this method of positive fixture mounting by means of a keyway in the table, parallel with the



FIG. 5—Surfacing the joint face of a connecting rod. Operator's left hand clamps the work, right hand applies infeed pressure. To distribute belt wear, the table is oscillated during the operation.

abrasive belt, cuts changeover and setup time from hours to minutes.

This discussion of wet-belt machining has of necessity been of a general nature, and many of the details which limit its application have not been touched upon. This is due largely to the fact that each operation, each piece and every different material carries its own problem and no hard-and-fast rule can be laid down. Only experience or consultation with the manufacturer can establish the desirability of employing it on production runs. On single pieces as encountered in tool and die rooms, the method can be employed without prolonged consultations.

## Tube Flaring Tools Carbide Tipped

THE idea of using Carbide lathe-center inserts as tube-flaring tools is reported to have multiplied tool life by ten to one at Douglas Aircraft Co., Inc., of Santa Monica, Calif., as compared with that obtained when conventional steel flaring tools were used.

The job to which these cemented-carbide tipped tools are applied consists of flaring the ends of aluminum tubing on a production basis. The machine employed for this purpose is a Leonard precision flaring machine. Speed range of the machine is between 350 and 1000 rpm. It was found that the high end of the range gave the best results.

The flaring tool used in the machine, is made up

at the Douglas plant by brazing a stock Carbide C-6 lathe-center tip of solid cemented carbide to a tapered steel shank having a special taper to fit the machine. The lathe center insert is  $\frac{9}{16}$  in. OD. This is large enough so that all the work done during the flaring operation is taken by the carbide and none by the less wear-resistant steel shank.

Douglas estimates that the high-speed steel flaring tools originally used on this job produced some 100 tubes before wearing out. The improvised Carbide flaring tools turn out at least 1000 pieces each before wear becomes pronounced and the tip of the tool has to be replaced or reground.

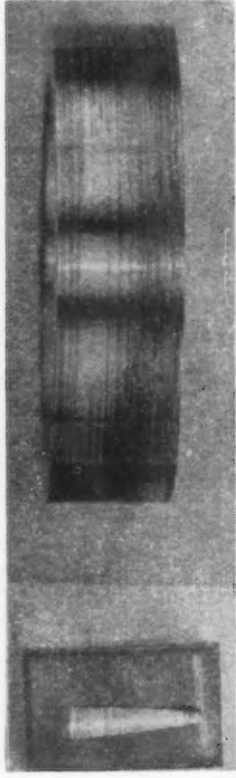
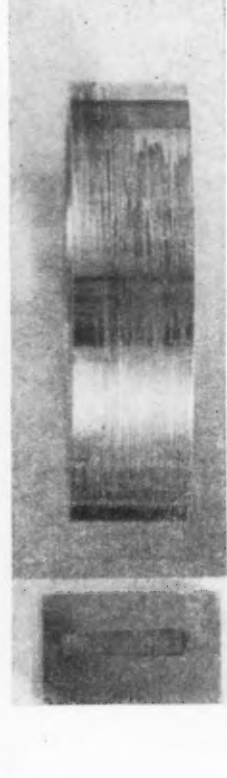
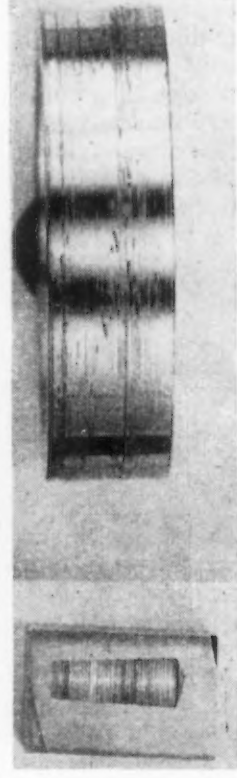
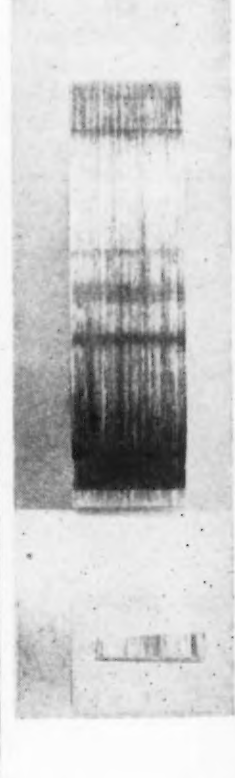
# Running Steel in Contact Without

**F**ACED with a special application which necessitated the running of steel against steel without the benefit of any lubrication whatsoever, engineers at Allis-Chalmers Mfg. Co., instituted a series of tests which yielded some interesting results. It

was necessary for the particular application being considered, that the surfaces be chemically clean, that they run without scoring or seizing, be resistant to ordinary atmospheric attack, and stay flat to within 30 millionths of an inch during operation.

TABLE I

Size of ring: 1.939-in. diam. X 0.513-in. wide. Load, 12 lb.; Surface speed, 400 fpm.

	Modified SAE 52100		Type 44C	5 Pct Chrome, Nitrided
	Ground	Superfinished		
<b>Analysis</b>				
Carbon.....	1.00	1.00	1.00	0.38
Manganese.....	0.35	0.35	0.40	0.35
Silicon.....	0.20	0.20	0.30	0.23
Chromium.....	1.20	1.20	17.00	5.00
Molybdenum.....	0.30	0.30	0.50	1.30
Vanadium.....	....	....	....	0.35
<b>Hardness of ring and block.....</b>	58 Rc	58 Rc	57 Rc	73 Rc
<b>Surface finish, m in.....</b>	18.5	7.2	20.5	22
<b>Operation time before scoring.....</b>	21 sec	11 sec	8 sec	42 sec
<b>Type of scoring.....</b>	Oxide	Oxide	Metallic build up	Oxide
<b>Appearance after 10-min run.....</b>				



# Lubrication

By R. C. EDWARDS

*Metallurgist, Allis-Chalmers Mfg. Co.*

It was an easy matter to test for corrosion resistance and stability, but some test procedure had to be established to give a picture of the galling characteristics of a material. It was decided to make use of a Timken wear testing machine, such as is normally used to test lubricating oils under pressure loading by running a hardened steel ring against a hardened block. The comparative merits of the steels tested were graded by the time required for the first sign of scoring to appear, and the surface condition of the test ring after an established test run.

The next important step was to select some steel that would meet all the requirements. SAE 52100 was tried because of the high hardness obtainable, and because of its ability to hold size, as in the manufacture of gage blocks. Corrosion resistance was overlooked for the time being. Test rings and blocks were made and hardened to 58 Rc, and the contacting surfaces were ground to 18.5 m in. The ring was rotated against the block at a surface speed of 400 fpm with a 12 lb load, and the test was run until the first sign of scoring appeared on the ring surface. Both surfaces were then observed, and the running time recorded. The test was then continued for 10 min. An outline of the test procedure and the results of the test are shown in table I.

The results of the SAE 52100 test were good in that the test ring rotated for 21 sec before scoring took place. After a 10 min run, only an oxide film was present, and there was no indication of seized or welded metal. An improvement in scoring time was tried by superfinishing the ring to 7.2 m in., but scoring appeared in half the time taken for the ground finish. There were also small scratches on the surface which would indicate that the improved finish allow oxides to scratch the surface. This material, however, was not considered suitable, as it was not resistant to corrosion.

A stainless steel, Type 440C, that could be hardened to the same hardness was next tried. It was

possible to meet all application requirements with this steel if it would be free from galling. Test rings and blocks were prepared comparable to the SAE 52100 with a 20.5 m in. finish, but the test showed this steel to be far inferior, as scoring occurred in 8 sec., and the ring showed evidence of galling due to intermediate clutching and breaking away of the contacting surfaces. This was probably due to the extremely high temperatures in minute areas. There was no sign of an oxide formed on the ring, but only metallic build up, as shown in the illustration.

An effort was made to improve the resistance to galling by passivating the ring and block. A black oxide finish was also tried, but neither process improved the results obtained on the first test.

From these tests it seemed that the ideal steel would be one with extremely hard surfaces capable of producing a fine oxide when running, and at the same time corrosion resistant and stable. A nitrided steel appeared to offer these advantages, and a 5 pct chromium, air hardening, tool steel was selected because of its small distortion in tool applications. Both stability and corrosion resistance proved to be good, and rings were therefore prepared and nitrided to 73 Rc with a surface finish of 22 m in. Operation time before scoring was twice as long as obtained with SAE 52100, and the oxide produced after the 10 min run was extremely fine and more uniform.

A trial lot of this nitrided steel was put into service, and the results were such that no further tests were run. It would appear from these tests, that in order to run two metals together without lubrication, it is necessary that they produce sufficient oxide for lubrication. High-chromium steels, however, will seize even though an oxide be introduced artificially. Also, the higher the hardness, the less the tendency to gall, since any seizing that may occur will tend to powder off instead of tearing a large area from either of the surfaces.

## Australian Tungsten Carbide Plant

BUILT to relieve a shortage caused by the war, the Broken Hill Proprietary Co., Ltd., Australia, constructed a ferro alloy plant at Newcastle which has succeeded in meeting all the company's tungsten carbide requirements as well as all its wartime alloy needs, the company has reported. The company is also considering developing ore resources in New Caledonia and at the present time is testing several sites there to determine the suitability of the ores. The Australian steel plant used 1,364,141 tons of iron ore from several small deposits in New South Wales to counteract the deficiency caused by lack of shipping, it reported. The New South Wales mines have now been closed however, as being uneconomical, when com-

pared with supplies from the company's normal source in Whyalla. Lack of adequate coal supplies was said to have made it impossible to recommission the Whyalla blast furnace which has been closed down for more than a year. Lack of coal has also adversely affected operation of the Port Kembla works of Australian Iron & Steel Ltd. In an effort to improve its coke situation, a new battery of coke ovens is under construction at Port Kembla, but labor and material shortages have forced temporary suspension of the program. Another major development at the Port Kembla works was reported to be the installation of a combination rod, bar and strip mill.

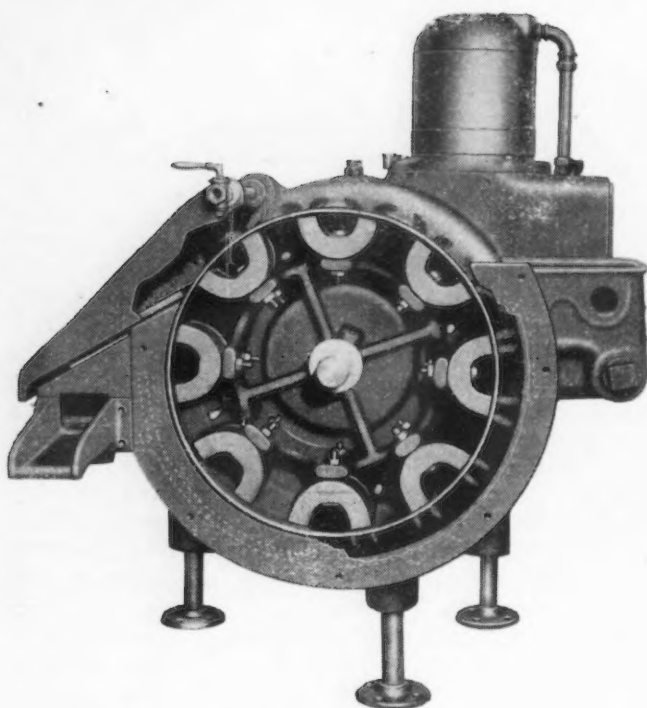


FIG. 1—Sectional view of the Barnesdril separator, showing the arrangement of the magnets and the induction magnetized apron which causes the swarf to stand erect and act as a filter.

**I**N the production of precision ground and honed surfaces, one of the most difficult problems to overcome has been the elimination of scratches caused by the presence of minute particles of metal or abrasive in the coolant. Elimination of these particles would permit of freer cutting through avoidance of wheel loading, and produce a better finish.

At one government installation it was required to hone the bore of recoil cylinders for various types of guns to a very high finish, and to extremely close tolerances. These cylinders varied from 3-in. to 10-in. ID, and from 30 in. to 90 in. in length. During the early production, scratches and pits on the highly finished surfaces resulted in rejections, necessitating honing oversize or scrapping.

Conventional magnetic separators were installed, and while these would remove the greater part of the metallic swarf, they had no effect on the abrasive dust, and it was impossible to obtain really clean coolant. Filters, on the other hand, would retain this dust, but it was so fine that there was considerable restriction of coolant flow, and filters clogged up very rapidly.

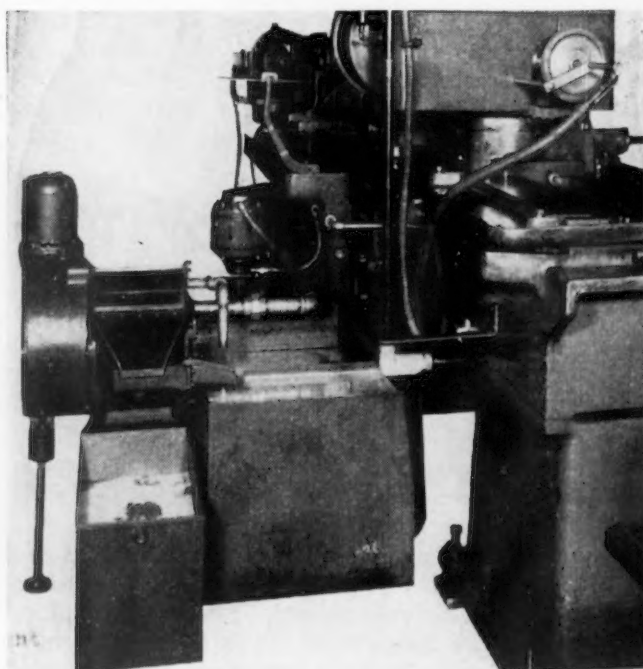
A Barnesdril magnetic coolant separator was then installed experimentally, and proved so satisfactory that a large number of these are now in use. This separator is electrically operated and automatically controlled, and consists essentially of a motor-driven, nonmagnetic drum in which are mounted a series of extremely powerful permanent magnets. (See fig. 1.) The coolant flows through the lower part of the separator in a counter direction to the rotation of the drum, and metallic particles, attracted by the magnets, adhere to the periphery. The magnetic inner surface of the cast iron frame surrounding the under portion of the drum serves as a magnetic shunt plate and causes the magnetized metal swarf to

# Clean Coolant Aids Honing

By WM. BAUMBECK

stand on end in rows extending across the full face of the drum. These extremely fine particles, closely held by magnetic attraction, act as a fine mesh filter to strain out the abrasive dust. As the drum rotates it passes by a scraper plate which removes the accumulated sludge and deposits it in a receptacle provided for the purpose, while cleaned coolant passes back to the machine reservoir. For honing work the drum makes one revolution every 8 min., and requires virtually no attention from the operator.

FIG. 2—Heald internal grinder equipped with Barnesdril magnetic coolant separator.





Considerable manufacturing savings have been accomplished due to the wheels being free of abrasive particles and being furnished with a constantly clean coolant. Higher speeds and feeds have been made possible, producing a finer finish in less time. Furthermore, by eliminating the constant cleaning of the swarf from the machines and coolant tanks, a considerable saving in labor has been effected. Before the installation of the separators, honing machines required cleaning every two months, and it required the services of two men for 6 hr to do the job. Approximately 4 in. of sludge was removed from the reservoir. Since the separators have been installed, these same machines require cleaning only once every 10 months, and approximately 1 in. of sludge has to be removed. In the intervals between machine cleanings, the separators themselves are cleaned about three times a week, an operation taking only 10 min. of one man's time.

Formerly, when grinding or honing the OD of piston and rods, trouble was experienced with scratches caused by particles in the coolant. Magnetic separators were installed on Cincinnati and other grinders, and very satisfactory results were obtained in that no further scratches or imperfections were experienced, and greater production and finer finish resulted. These separators were also installed on Heald internal grinders for finishing the ID of bushings with equally satisfactory results.

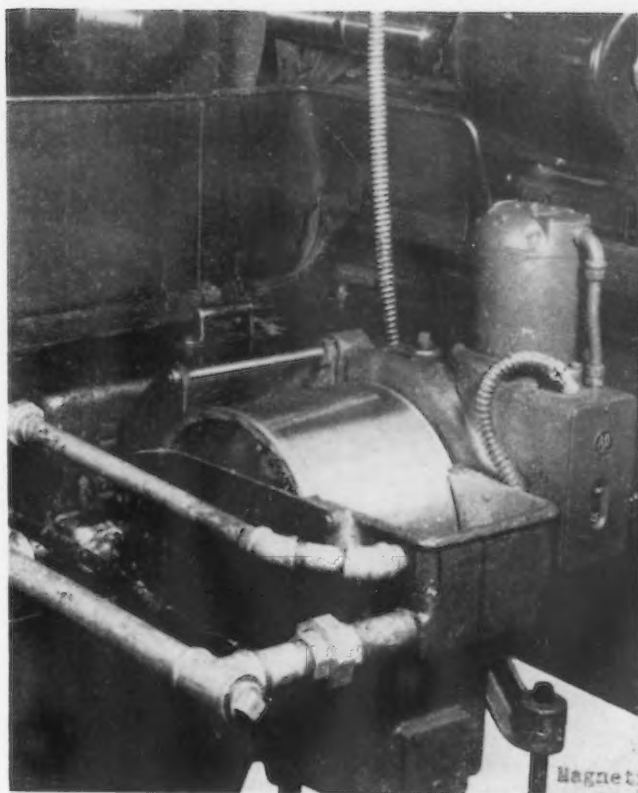


FIG. 3—Installation of separator on a Cincinnati plain cylindrical grinder.

## Castings Salvaged by Dot-Welding

DEVELOPMENT of the Mogul Dot-Weld process which eliminates residual stress and contraction resulting from high-temperature welding, has been announced by the Metallizing Co. of America.

Dot-Welding is an improved technique of spot welding, and is said to be the closest practical approach to a true cold weld. It utilizes the new Mogul Quench-Arc welding machine, a high-amperage, low-voltage unit operating on alternating current, and the unique Dot-Weld pistol. The combination affords depths of penetration from 0.001 to 0.03 in., yet all danger of high temperature is eliminated by a specially designed air-pressure unit built into the pistol. This quenches the electrode and the arc in a constant stream of cooling air, preventing the development of high heat volumes in the base metal, and consequent heat distortion and residual stresses.

The process makes possible the low-cost salvage of ferrous and most nonferrous castings rejected because of blowholes and other defects, by providing a fast, readily machinable fill-in deposit of aluminum, bronze, nickel, or zinc which can be applied to any metal. It can also be used for parts repair where tapping is necessary.

The quench-arc principle permits broader sequence of spot welding and multiple passes, without the resultant irregular bluewalls caused by dwells, and is an important reason why with this process even inexperienced operators can turn out perfect weld jobs every time.

In addition to its application in the speedy repair of defective castings, Dot-Welding can be used for press fit work, the repair of cracked engine blocks and heads of internal combustion engines, and the building up of aluminum, bronze, steel, and grey iron patterns. As a versatile putting-on tool, it should find wide applications in foundries and machine shops.



# Carbursintering

By A. S. MARGOLIES

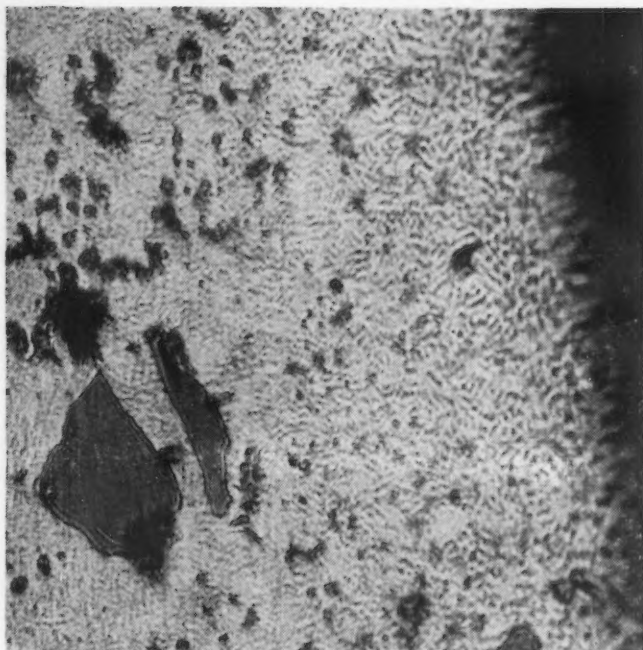
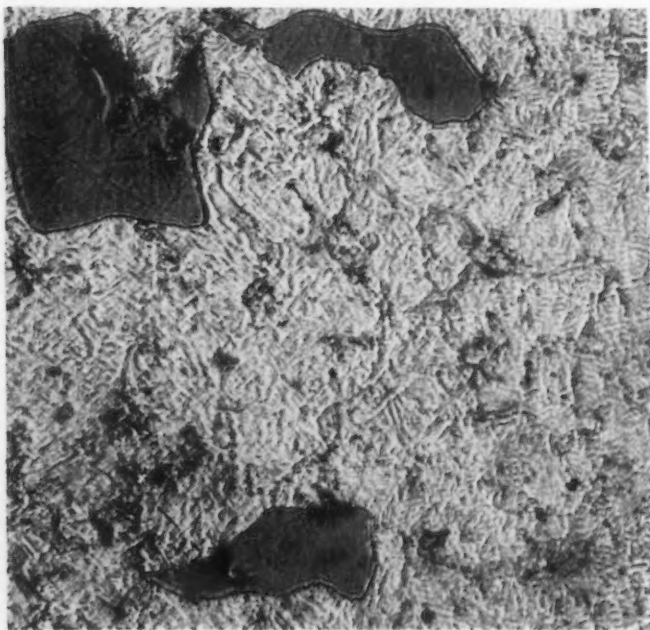


FIG. 1—Structure of case, as quenched, pressed at 75 tons per sq in., carbursintered for 2 hr. 500X.

THIS investigation endeavors to show some results of combining what are actually two of the oldest arts of metallurgy. The carburization of farm and war implements is believed to date 1200 to 200 B.C.<sup>1,2</sup> based upon the metallographic examination of such articles found in Egypt and India. The art of powder metallurgy is of much more recent origin, since Wollaston's method of making platinum<sup>3</sup> in 1829 is generally mentioned as the first example, although the beautiful manuscripts of the first and second centuries incorporated the use of gold powder.<sup>4</sup>

Carburized steels are used to meet the requirements of a hard wear-resistant surface and a tough core. The carburization of low carbon steel may proceed with the use of solid, gaseous, or liquid

FIG. 2—Structure of core, as quenched, pressed at 75 tons per sq in., carbursintered for 2 hr. 500X.



carburizing agents. In both solid and gas carburizing, it is believed that the actual carburization takes

*For a complete review of the subject of gas carburizing, see THE IRON AGE, Oct. 18, 1945, p. 50.*

place by the mechanism of carbon monoxide gas on the steel.<sup>5</sup>

The process of pack carburizing (utilized in this investigation) consists of "adding carbon to the surface of iron-base alloys by heating the metal below its melting point in contact with carbonaceous solid."<sup>6</sup> There are two steps involved in this action; (1) carbon enrichment of the metal surface, and (2) diffusion from the surface into the interior. The factors of temperature and time affect both steps; also the carburizing mixture affects step (1) and the nature of the steel affects step (2).

The carburizing mixture combines with the oxygen in the air of the container at elevated temperatures and generates a gas of carburizing and reducing properties. The fact that such an atmosphere exists, together with the use of elevated temperatures, fulfills the necessary requirements for successful sintering.

Sintering is generally defined<sup>7</sup> as; (1) the bonding of solid bodies by atomic forces, and (2) the bonding of solid bodies by the application of pressure

*For previous articles dealing with iron powders, see THE IRON AGE, May 17, 1945, p. 65, and Sept. 27, 1945, p. 50.*

and heat. The process of sintering usually takes place at elevated temperatures, but below the melting point of the major constituent.

In the majority of processes, the powders are compacted in a closed die at room temperature and then transferred to the sintering furnace. Pressing tends to rupture the oxide films on the surfaces of the powder particles and increases their surface-to-surface contact.

Diffusion of the metal powder particles at their surfaces is encouraged by the sintering of metal powder compacts. The use of a protective, neutral atmosphere prevents metal oxidation at the elevated temperatures; the use of a reducing atmosphere exerts positive action in removing the oxide films and furthering the diffusion process.

The variables most affecting the sintered compacts (of a constant analysis powder) are compacting pressure, sintering temperature, and sintering time.

The latter two items are also variables in the



# g of Iron Powders

**Iron powder was compacted at various pressures and then carbursintered, i.e. carburized and sintered simultaneously, for various times at 1700° F. The microstructures and physical properties of the products obtained are reported herein with recommendations for use of this process for commercial applications.**

process of pack carburization," and it can be seen how sintering and carburization may be combined into one simultaneous process "carbursintering."

## Conditions of the Experiment

The specimens (approximately 30 g in weight) were pressed in a split-type tensile die, using machine oil as a lubricant on the die walls. After pressing, nine specimens (triplicate at each of the three pressures: 25, 50, and 75 tons per sq in.) were placed in the container and held in position by the carburizing compound. The container was entirely closed, and fresh carburizing compound was used for every run.

The container and load were put into the furnace (already at heat) and the time was measured from the moment that the container reached the furnace temperature (1700°F). After the charge had been up to heat for the required length of time (2, 4, and 8 hr), the specimens were individually quenched into water.

Simultaneously sintering and carburizing iron powder compacts—carbursintering—has revealed many interesting results. When it was decided to vary only the compacting pressure and the time at temperature, the trends were soon apparent. Increased compacting pressure and decreased carbursintering time resulted in improved physical and mechanical properties and deeper cases, tables I to IV.

Very little can be said about the comparative metallographic structures of the case and the core in the quenched specimens. Two representative photomicrographs, figs. 1 and 2, are included in this article. The porosity of the case and the core seemed to be the same for all sets of conditions and the porosity of both case and core decrease with increased compacting pressure—checking the trend of the porosity values as determined by weight-volume measurements. For all of the quenched specimens, the matrix appeared to be martensitic with porosity and iron oxide inclusions inherent in this type of iron powder.

The quenched specimens were annealed at 1750°F in dissociated ammonia to obtain pearlitic structures.

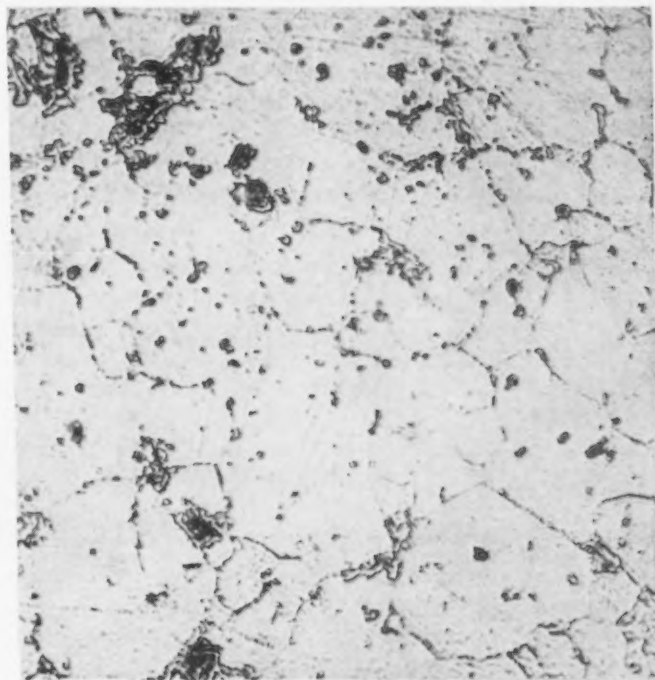


**FIG. 3—Structure of case, as annealed, pressed at 75 tons per sq in., carbursintered for 2 hr. 500X.**

The carbon contents of the case and of the core were then judged by comparison with "High Purity Iron-Carbon Alloys" (photomicrographs of varying carbon content) by Harry K. Hirschman, metallurgist, National Bureau of Standards. Layers of the case and of the core were milled off several check specimens and carbon analyses were made.

Increased compacting pressure resulted in cases with higher carbon contents and cores with lower carbon contents, table V. The photomicrographs, figs. 3 and 4, show that the annealed structures are not completely pearlitic, in that agglomerated car-

**FIG. 4—Structure of core, as quenched, pressed at 75 tons per sq in., carbursintered for 2 hr. 500X.**



Pressure, Tons per Sq In.	Density, G per cc	Porosity, Pct	Hardness, Rb
25	5.58	29.1	87
50	6.45	18.0	98
75	6.89	12.4	101
Pressure, Tons per Sq In.	Tensile Strength, Psi	Percent Deviation	Elongation, Pct (per in.)
25	29,800	11.8	0
50	54,800	14.4	0
75	56,300	1.4	0

bides are very evident in the cases and less markedly evident in the cores. The blurred gray or black areas are graphitic carbon which was present to quite an extent in the cases. Due to these two conditions, the carbon contents of both cases and cores are higher than would seem to be indicated by these metallographic structures.

The increase in compacting pressure on metal powders normally results in higher values of physical and mechanical properties and, in general, tends to cause the compact to behave more nearly like massive metal. That trend was expected and did appear in these results in some measure, must explain the reason for the higher carbon content and greater depth of case with increased compacting pressure. Density must be an important factor since increased pressure resulted in increased density and also resulted in deeper cases and higher carbon contents in those cases.

Reviewing what had earlier been mentioned, the normal action of carburization takes place in two steps; (1) carbon enrichment of the metal surface, and (2) diffusion of carbon into the core. Apparently, the more porous compacts were permeated by the carbonaceous atmosphere which (1) lost some of its effectiveness by combining with the entrapped air within the compact; (2) uniformly penetrated the compacts without the normal carbon build-up at the surface. Authorities<sup>8</sup> agree that there is much to be learned about the effect of oxygen in the steel during carburization, and that both the entrapped air and the oxide inclusions may effect the action of carburization.

To explain the influence of time on the results is rather difficult. An increase of sintering time on

metal powder compacts normally results in improved physical and mechanical properties—although the effect of compacting pressure is much more apparent. The results actually obtained in this investigation show that the carbursintering times of 4, 2, and 8 hr gave decreased case depths and surface hardnesses in the order named. The question naturally arises as to why 4 hr should give results superior to both shorter and longer periods of time.

The twofold action of the carburization process must once again be analyzed to offer a possible explanation for the phenomenon. If it is assumed that the difference in case characteristics between specimens carbursintered for 4 and 2 hr is within experimental error, see tables 2 and 3, then the effect of time may be said to be similar to its effect in massive steels but in a more rapid manner. The carbon enrichment at the surfaces builds up first and increased time allows the diffusion of carbon from the surface to the core to take place. The base metal used in this investigation—hydrogen—reduced iron—is relatively purer than the usual commercial carburizing steels; consequently, the iron—lacking the common impurities and alloying elements (such as carbon, silicon, and manganese)—is “hungrier” for the carbon of the carbonaceous atmosphere and the reaction



proceeds at a more rapid rate. The surface build-up takes place sooner and the carbon diffusion takes place sooner than in massive metals, although the former action precedes the latter as is normal.

The possibilities that some of the results may lie within experimental error should be emphasized since; (1) the hardness of sintered compacts as tested by a standard penetration tester is believed to be lower—due to porosity—than the “actual” hardness, and (2) the tensile testing of flat specimens is not as satisfactory a method as using standard threaded-end tensile specimens. It must be remembered also, that normal variables in carburization (such as position of the specimens, etc.) have not been eliminated from this investigation.

#### Various Commercial Applications

From the point of view of commercial applications, high values of hardness (as-quenched 52 Rc), case depth (0.04 in.), case carbon content (1.25 pct), and tensile strength (66,000 psi) are possible without complex processing and equipment, requiring cold compacting of the powder at 75 tons per sq in.,

Pressure, Tons per Sq In.	Density, G per cc	Porosity, Pct	Hardness, Rockwell
25	5.48	30.3	B-98
50	6.37	19.0	C-46
75	6.95	11.6	C-53
Pressure, Tons per Sq In.	Tensile Strength, Psi	Percent Deviation	Elongation, Pct (per in.)
25	28,700	±4.2	0
50	54,700	1.0	0
75	68,300	10.8	0

Pressure, Tons per Sq In.	Density, G per cc	Porosity, Pct	Hardness, Rc
25	5.53	29.6	21
50	6.52	17.1	43
75	7.01	10.9	52
Pressure, Tons per Sq In.	Tensile Strength, Psi	Percent Deviation	Elongation, Pct (per in.)
25	28,600	±8.3	0
50	61,200	7.6	0
75	68,900	1.7	0



carbursintering at 1700°F for approximately 3 hr and quenching from that temperature into water. For the same type of iron powder—processed by a typical powder metallurgy sintering operation—the comparative properties are hardness, 13 Rb and tensile strength of 31,000 psi.\*

Here, then, is a process which results in a product superior to that of the usual ferrous powder metallurgy methods, requiring less expensive equipment (eliminating the special atmospheres and gas-tight furnace muffles usually necessary) and still retaining the small-part, high-production features of powder metallurgy.

The products produced by this method are suitable for commercial applications where high stress endurance is not a critical requirement (since there was no elongation and no yield point evident), but where wear resistant properties are desired.

Further investigation with the aim of improving the products of carbursintering may well include; (1) the use of a different type of iron powder which normally gives better physical and mechanical properties; (2) a study of the effect of the third variable—temperature; (3) the carburization of compacts already sintered; and (4) a heat treatment subsequent to carburization—other than a direct quench—to obtain a refined microstructure.

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TABLE IV Case Depth in Inches			
Pressure, Tons per Sq In.	8 Hr	4 Hr	2 Hr
25	Nil	Nil	Nil
50	Nil	0.03	0.02
75	0.01	0.04	0.03

\* Carburization very irregular.

TABLE V Combined Carbon Content, Pct						
Pressure, Tons per Sq In.	8 Hr		4 Hr		2 Hr	
	Case	Core	Case	Core	Case	Core
25	0.55	0.40	0.50	0.45	0.70	0.50
50	0.70	0.35	0.70	0.35	0.85	0.30
75	0.80	0.25	0.85	0.28	1.25	0.25

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## British Design Light Metal Truck

A LIGHTWEIGHT truck which combines light-alloy construction with carefully selected mechanical components has been designed by Jensen Motors Ltd., West Bromwich, England, and is described in *Light Metals*, London.

The body and chassis together form, in effect, a single unit. Two straight and deep I-section light alloy beams extend from end to end of the vehicle, being joined by cross-members of similar section placed at suitable points, which include spring anchorage. Diagonal braces, also of light alloy, are placed along the length of the frame to increase lateral rigidity. All joints in this main structure are riveted.

Carried directly on the main beams, the floor consists of light alloy sheet formed into rectangular corrugations. Wooden strips fill the spaces on the upper side of the floor.

In the cab is some steel framing, square tubes being

used for certain parts, as doors, for the example, to give the desired rigidity. All steel parts of the frame and body are cadmium plated to prevent corrosion.



# New Motion-Transformer Developed

o o o

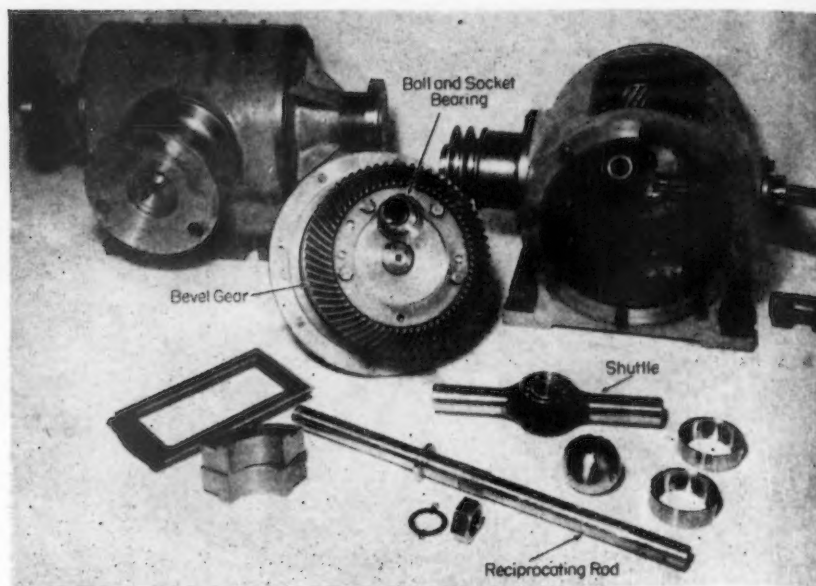


FIG. 1—Breakdown showing the small number of parts and great simplicity of the new motion transformer for converting reciprocating into rotary motion.

**L**ONG sought by engineers, a new motion-transformer for converting rotary into reciprocating motion, or vice versa, and which eliminates crankshafts, wrist pins, and connecting rods, has now been perfected and has successfully passed severe experimental tests.

Developed under the sponsorship of the CPA's Office of Production Research and Development by contract with the Utah Scientific Research Foundation, of which Dr. E. G. Peterson is executive director, in association with the Utah State Agricultural College, the new device is unique, and it is believed that many uses will be found for it as soon as engineers and designers become familiar with it.

This new movement successfully provides a simple harmonic motion which eliminates the unbalanced crank effort and piston side thrust that are the unwelcome characteristics of the conventional crankshaft and connecting rod type of engine, and it permits a natural, built-in, speed reduction over a moderate range from one to one and upward. Through reduction of the number of moving parts it is possible to reduce the weight per horsepower approximately one third over that required for conventional designs.

The entire mechanism may be

enclosed in a small splash lubricated case with the only external connections consisting of a short shaft extension which receives or delivers the rotating motion, and opposite to this, on the same axis, a reciprocating rod which may receive or transmit the reciprocating motion. Inside the case are two bevel gears and a meshing bevel pinion which is placed between them and mounted on the rotating shaft that extends through the casing.

In the disk center of each of the bevel gears is a ball-and-socket bearing, the balls of which have holes through their centers. The gears are placed so that both balls are in a straight line across from one to the other. A shuttle or trunnion bar is then mounted so that one end is inserted in each of the balls. The reciprocating rod passes through a hole in the shuttle, half way between the bevel gears and parallel to them. One end of this same rod passes through the casing to form the reciprocating end connection.

When the bevel pinion is rotated, it causes the bevel gears to rotate in opposite directions. This action imparts a reciprocating motion to the rod mounted in the shuttle, while the shuttle itself oscillates on the axis of the reciprocating rod. Thus it accommodates itself to the circular move-

ment of the ball-and-socket bearings in which the shuttle is mounted.

Actual operation of the machine is very smooth, vibration is negligible, and the mechanism has an efficiency comparable to that of the best designed speed reduction systems. The simple harmonic motion assures a smoothness and uniformity in the transmission between reciprocating and rotary motion which places it at the head of the field in which the Scotch Yoke had previously been considered supreme.

In the case of steam engines it will be possible for the designer to make a steam valve which will cut off at equal points on both ends of the cylinder, and also at equal points with regard to the crankshaft revolution. It will be possible to attach a single or double-acting cylinder to one or both ends of the crankcase, and the fact that the length of the crankcase is less than twice the stroke, as compared with four and one half stroke lengths for the conventional engine, will mean a substantially smaller and lighter engine.

The mechanism has been patented by James A. Hardman of Utah, and all patent rights have been assigned to the Research Foundation to facilitate contacts with interested parties.



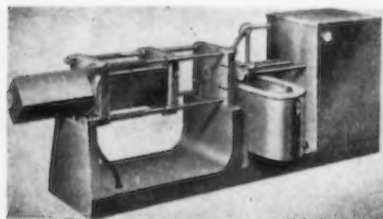
# New Equipment . . .

## Foundry

. . . In this week's issue are described interesting developments in foundry, including leggings and spats, melting furnaces, electric melters and casters, die casting machines, conditioners and removers, and centrifugal casting machines and a few other items.

### Protective Clothing

**A**N entirely new line of die-casting machines has been announced by *H. L. Harvill Mfg. Co.*, Vernon, Calif. Four basic machines are included in the line with various sizes available in each. The second of these four machines is the HDA Series of automatic air-operated machines for casting zinc,



tin and lead alloys. These machines depart from the conventional gooseneck injection method commonly used for casting these nonferrous, low melting point alloys. In contrast to a gooseneck, which is submerged in a pot of molten metal, this machine embodies a metal feeding device which feeds a continuous stream of the molten alloy into a horizontal injection chamber. Injection of the metal into the die cavity is accomplished by an air-operated ram developing as much as 1410 psi pressure on the metal in the die cavity during the period of metal solidification. Controls are so designed as to allow either semi-automatic operation with the operator controlling the injection of the metal and the ejection of the casting, and the machine automatically performing the other functions, or the machine may be operated fully-automatic, in which case a single operator can service as many as three machines simultaneously in operation.

**S**CIENTIFICALLY designed and made to provide maximum protection, a legging and a spat have been announced by *American Optical Co.*, Southbridge, Mass. The AO legging is said to be designed to accomplish three major objectives; complete leg protection for foundry and other industrial workers, easy adjustment, and quick release. The legging is claimed to protect front, back and sides of leg, from instep to knee. It is available in chrome leather, specially tanned to resist heat and hot metal splashes, and may also be obtained

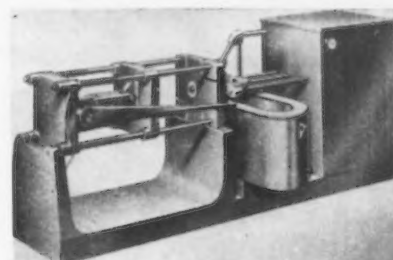


in asbestos or fire resisting duck. The spat is designed identical in construction with the legging, except for its shorter length.

### Die Casting Machine

**T**HE first of a new series of machines announced by *H. L. Harvill Mfg. Co.*, Vernon, Calif., is the Model HD-1AM1 for casting tin, lead and zinc alloys. This machine is said to be efficient for the

production of small to medium-sized castings. It embodies outstanding metal injection and operating features normally found only in larger and much more expensive equipment, excepting that the operation of the movable die platen is accomplished by a hand lever. Production output is controlled by



the physical capacity of the operator of the machine, and it is claimed that this may reach 300 to 400 cycles per hr. It will also accommodate dies having a vertical dimension of 8 in. and a horizontal dimension of 12 in. Injection of the metal is accomplished by a horizontal ram similar to those used in cold chamber equipment rather than the gooseneck injection assembly.

### Melting Furnace

**A** TOP-fired crucible melting furnace, using two crucibles (fired with gas or oil) in tandem, has been announced by *Radiant Combustion, Inc.*, Warren, Ohio. This furnace holds two crucibles, loaded at all times and alternately fired. Among the advantages claimed for this furnace is faster heating through combined radiant and convection heating, burners cannot plug because they are in the top where slag or metal cannot

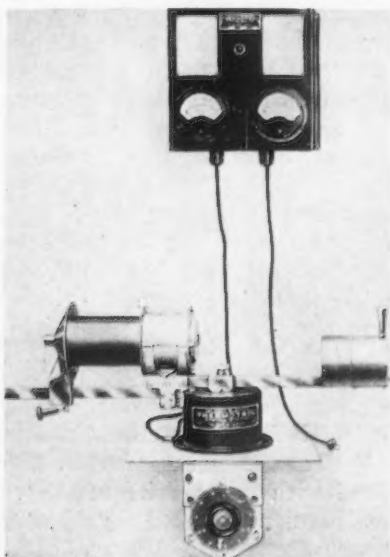
reach them, and far lower metal loss as the flame does not impinge on the metal. The metal is visible at all times, and temperatures can be taken whenever desired without shutting off the burners. The lin-



ing is easy to replace as there are no burner ports to contend with, and flue gases can be flued through the floor, thus eliminating heat and gases in the foundry.

#### Electric Melter and Caster

**T**HE Jelenko Thermotrol, an electric melting and casting machine of the spring-powered, high-speed, straight arm, centrifugal type, which has been especially designed for precision casting, has been announced for general industrial use by the *Jelrus Co.*, 150 W. 52nd St., New York 19. The metal is melted in a carbon-monoxide re-

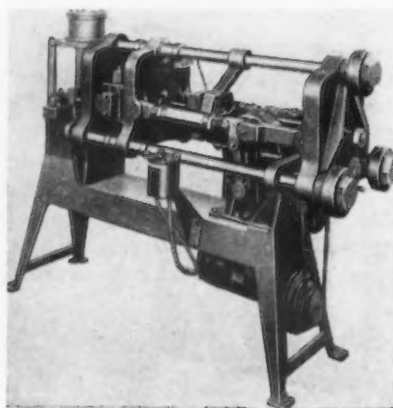


ducing atmosphere in a graphitic composition crucible in a closed, electric melting chamber. Accurate control of casting temperatures is provided by a variable transformer and a meter, by which the current passing through a melting chamber

is regulated. Temperatures are indicated by a pyrometer. Thermotrol is made in two models with heating range up to 2300°F for industrial use.

#### Die Casting Machine

**A** DIE casting machine for the production of small zinc, tin and lead alloys, operating on a principle different from that of any machine previously made, has been announced by *Light Metal Machinery Inc.*, Erie, Pa. Characteristics of this machine are said to be as follows: (1) its casting cycle is completely automatic, with die movement, injection and ejection all actuated by one extremely simple mechanism; (2) it has four operation speeds; (3) castings can be made in a single-cavity die at production rates equal or superior to those of large machines; (4) like many other parts of the machine,

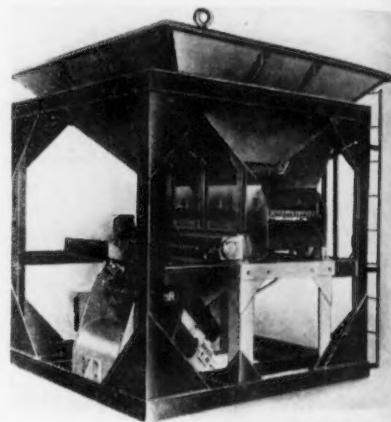


the pressure pot assembly can be removed and replaced in 15 to 20 min; (5) it operates with either air or hydraulic pressure on the injection plunger, and (6) it is possible with this machine to make castings of superior quality, greater uniformity and dimensional accuracy, with extremely low reject rates.

#### Combination Sand Conditioner

**A**N improvement which expedites the movement from one molding bay to another of the Royer combination scrap remover and sand conditioner has been announced by *Royer Foundry & Machine Co.*, Kingston, Pa. Formerly, when the Royer combination was moved by crane about the foundry, it was necessary for a man to climb a ladder to engage the four hooks at the corners of the unit with a

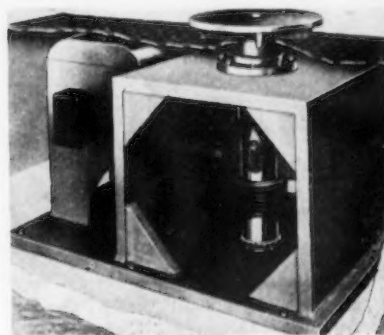
slings attached to the crane. Royer engineers have eliminated this difficulty by a simple design change. Now a strong inverted Y bar is installed in the center of the unit



at the top, with an eye at its upper end, which directly engages the crane hook.

#### Centrifugal Casting Machine

**B**UILT for heavier off-balance loads, for continuous high production and for free-spinning power, the Master model centrifugal casting machine has been announced by the *Centrifugal Machine & Engineering Co.*, 666 Jackson Court, Kalamazoo 7, Mich. The hub is said to be heat free and to have the feature that provides for



continuous production operation with permanent molds attached directly to the heavy table mounting-plate. This machine also has motor mounting which is adjustable to standard belt lengths to permit greater variance of speeds by mechanical changes of drive pulley. Protective hoods and spill pans which are constructed of 10-gage sheet steel according to individual needs and specifications, and their telescoping feature makes possible adjustment to any height from 8 in. upward as needed.





## REVERE SHEET AND STRIP FOR DRAWN PARTS

FOR all products to be made by drawing, stamping and similar sheet metal operations, Revere sheet and strip of copper or brass offer maximum ease of fabrication. Not only are these metals naturally ductile, but they benefit further from the metallurgical skill which Revere has gained in 145 years of experience.

In composition, mechanical properties, grain size, dimensions and finish, you will find Revere metals highly uniform. They enable you to set up economical production methods and adhere to them. They can help you produce better products at faster production rates, with less scrap and fewer rejects.

Revere copper, brass and bronze lend themselves readily to the widest variety of finishing operations—polishing, lacquering, electro-plating and others. With these superior materials it is easy to make your products beautiful as well as serviceable.

That is why wise buyers place their orders with Revere for such mill products as—*Copper and Copper Alloys*: Sheet and Plate, Rolls and Strip, Rod and Bar, Tube and Pipe, Extruded Shapes, Forgings—*Aluminum Alloys*: Tubing, Extruded Shapes, Forgings—*Magnesium Alloys*: Sheet and Plate, Rod and Bar, Tubing, Extruded Shapes, Forgings—*Steel*: Electric Welded Steel Tube. We solicit your orders for these materials.

# REVERE

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# Assembly Line

STANLEY H. BRAMS

- GM strike settlement delayed due to internal union political factors.
- ... Ford negotiations slowed by differences over the final details.
- ... DeSoto shows 1946 models.



**D**ETROIT—Steel strike hang-over continues to give the automobile industry a headache. Production continues in very low ground because a large number of supplier companies struck by the CIO United Steel Workers Union have remained down pending clarification of pricing policies, inasmuch as they will now pay an average of \$5 a ton more for steel, are being asked to negotiate 18½¢ pay raises for their employees, and still have been given no product pricing relief.

Production slipped off, according to Ward's Reports, Inc., to 19,700 assemblies last week. This compared with 21,555 in the preceding week and 21,015 in the same week last year. The failure to better last year's comparative figures, when only trucks were being made, is apt indication of the paralysis which continues to grip the auto industry.

Not only are the supplier plants strikes acting as an impediment to production. The General Motors strikes continues to eliminate all the production of that largest producer in the industry, and also has shut down Packard Motor Car Co.

More than two weeks of negotiations have now been undertaken to

settle the GM strike—negotiations which have really been on a very serious basis—but inherent difficulties in the problem blocked a settlement. The fact of the matter is that the biggest factor at play in this strike has been the political fortunes of Walter Reuther, vice-president of the CIO-United Auto Workers Union and in charge of its GM department. To explain this requires some background—

When Mr. Reuther called the strike last November he did so against the wishes of the majority of the union's executive board and against the wishes of Philip Murray, president of the CIO, who had intended his steel wage drive to kick off the pay increase program. At the time Reuther called the strike the indication was that he was actuated by political ambitions within UAW and CIO. If he could beat the gun, stop General Motors and then wind up on a victorious basis he, rather than Murray or the rest of UAW, would be the trail blazer. The presidency of the auto union, a goal he has quietly cherished for some years, would fall into his lap like a ripe apple.

But things went wrong. Instead of obtaining a settlement at General Motors in 30 or 40 days, as he apparently expected, GM showed little inclination to fall in with his plans, however unwillingly. There was little competitive pressure from other companies, all of whom were having problems getting into 1946 model output, and of course tax considerations reduced the amount of loss which would otherwise have been caused by the shutdown during the last portion of 1945. At the same time General Motors felt very strongly that it would not be a party to any wage raises based on ability to pay, at that time the battlecry of the Reuther forces, nor would the company bind itself not to seek price release in the event of any pay raise, as demanded also by the Reutherites.

After the first of the year the Chrysler and Ford agreements were reached providing for pay raises of 18½¢ and 18¢ respectively. This level of settlement was based on the

report of the fact-finding-panel in the General Motors case and on Murray's own final pre-strike demand on steel. The upshot of the matter was that Chrysler and Ford workers obtained pay raises while GM employees were still out on the picket line without any material advantage accruing to them for their long period of idleness.

**A**CCORDINGLY, Mr. Reuther is now at the point where he must be able to show some kind of gain to his constituents purely in order to save face. But the company is stung by Mr. Reuther's attitude, by his complaint of unfair bargaining practices made to the National Labor Relations Board, and by other of his tactics. Accordingly there is little personal inclination to settle on any grounds which will enable Mr. Reuther to portray himself in a good light to his followers. At the same time, General Motors is intent on getting maintenance of membership as such out of the contract. Naturally this objective would be quite fatal to the red-haired Reuther; once that position was outlined he faced the possibility not only of getting no more wage advance than took place in other companies without a strike, but also of coming out of the negotiations with a less advantageous contract than he entered them with. So, the stalemate.

In spite of the lack of such external considerations, the Ford negotiations were also dragging through February. This appears to have been the outgrowth of a technique in bargaining approved by both parties which seemed based as much on hope as on hardboiled experience. Subcommittees negotiated individual issues at stake in the bargaining. Then they brought their recommendations to the top bargaining committee, comprising representatives of both Ford and UAW, only to find the top committeemen not wholeheartedly agreeing with their conclusions and phraseology. As a result, the top committee began to thrash over the whole subject matter, resulting in the inevitable reopenings of most



*all this...and welcome, too!*



## At the A. S. T. E. Show

Whether you are a tool engineer or manufacturing executive, you will want to visit the *two* Pratt & Whitney Booths at the A.S.T.E. New Era Exposition in Cleveland's Public Auditorium on April 8 to 12. And you will be warmly *welcomed*.

In the center of the Arena floor (Booth 214-313) will be the newest in cutting tools including tungsten carbide, and the latest in precision gaging equipment. A whole new line of Electrolimit External Comparators will be introduced for the first time, plus the new Selectronic Gaging Machine and the new Lead Tester. A complete "Standards Room" will be on display . . . with our experts on hand to show you the latest quality control practice.

In *Booth 1612* (Lakeside Hall) there will be a working exhibit of Kellerflex Flexible Shaft Machines in all sizes and varieties. Here you can see actual demonstrations of bur cutting and finishing on many materials . . . even try it yourself if you like. Here, you can find the solution of many handfinishing problems by the use of "mechanical muscle".

You will want to see all this and more. So come to *both* P&W Booths. You will stay a long time, and leave feeling that your time was pleasantly and profitably spent.



# PRATT & WHITNEY

Division Niles-Bement-Pond Company

WEST HARTFORD 1, CONNECTICUT

of the problems at stake. This is the reason a Ford contract was expected day by day during mid-February but did not materialize.

**W**HILE its two major competitors are stymied by manufacturing problems — GM by the strike, Ford by unavailability of supplier-produced parts — Chrysler has been getting out a few cars and this week announced its 1946 DeSoto on the heels of the 1946 Chrysler announcement made last week (*THE IRON AGE*, Feb. 21, 1946, p. 68). The new DeSotos provide improved performance standards made possible by a number of engineering changes. New transmission is embodied in these cars, shifting gears hydraulically and intended to provide fast getaway. A fluid drive is linked with the new "tiptoe" shift.

New hydraulic brakes are provided. Smaller wheels are used, and larger tires are mounted on a safety rim. Also of note is the new oil pump and a self-cleaning gasoline filter similar to that in the Chrysler. The L-head type engine is continued, using aluminum alloy pistons unavailable during the war, designed to impose less bearing load and to smooth engine performance.

The front end has been entirely redesigned. Wide shouldered front fenders flow back into the body. A new diecast grille of wide chrome vertical bars extends across the front of the car, while body, fender and body side moldings of chrome are wider, lowered and tapered to follow the body design. The new headlights are widely spaced. A bumper six in. wide wrapped around the front fenders is the latest auto-

motive manifestation of chrome extravagance.

The deluxe line of DeSoto will include a 3-passenger coupe, club coupe, 2-door and 4-door sedans. The custom line will include the club coupe, convertible coupe, brougham, 4-door sedan, 7-passenger sedan and 7-passenger limousine. Ten colors and four two-tone combinations are available.

An epoch ended last week when Alvan Macauley resigned as president of the Automobile Manufacturers Assn. He took over that post 18 yr ago, in 1928, serving through periods of unparalleled prosperity, deepest depression and war. He was first elected a director of AMA in 1913. He continues as chairman of the board of Packard Motor Car Co.

### January Car Output Low

Washington

• • • January production of passenger cars totaled 58,775 units as compared with 30,022 for December, according to CPA. The continued low output was due to the GM strike and partial stoppage of another manufacturer through inability to get parts. Commercial truck production for the same month amounted to 54,864 as compared with 29,542 in December.

Prospects were not bright for a continued truck increase during February, however. Despite the end of the steel strike, difficulties in the plants of manufacturers and suppliers continue to adversely affect steel deliveries and will do so for the next few weeks.

While January production of

trucks met manufacturers' forecasts for the first time since all restrictions were removed, the 60,000 units previously estimated for February has now been revised downward to about 40,000, informed sources said this week.

In respect to the shortage of certain types of textiles needed by the automotive industry, the CPA and others responsible for increasing textile production said they were taking all steps possible to alleviate the situation.

### Ford Plant Shutdown Caused by Shortages

Detroit

• • • Inability to get motor blocks, fans, water pumps, connecting rods, seat springs and hydraulic lift springs from outside vendors necessitated the shutdown of manufacture and assembly of tractors at the Highland Park plant of Ford Motor Co. recently. This plant produces farm vehicles for Harry Ferguson, Inc.

Approximately 2500 men were made idle by the discontinuation of manufacturing operations. About 46,000 other Ford workers had already been laid off due chiefly to the effects of the steel strike.

More than 4000 tractors had been built at Highland Park in February before the shutdown, with production approximating 350 units daily. M. L. Bricker, Ford vice-president in charge of manufacturing, said he was hopeful that Ford supplier would be able to settle their labor and production problems by the middle of March.

### CC Priority Rate For Small Electric Motors

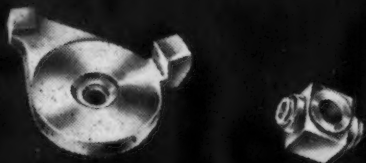
Washington

• • • Because of what it said is the urgent need for housing and many other consumer-type goods, CPA has extended CC priority ratings to fractional horsepower electric motors for production, materials and capital equipment and to producers of electrical high silicon steel sheets. Assistance was offered the latter for capital equipment and construction materials for new plants or expansion of old plants.

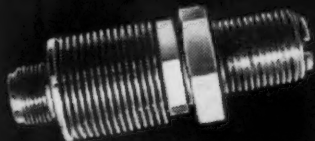
NEW DESOTO: The broad sweep of the fenders on the 1946 DeSotos is well indicated in this photograph.



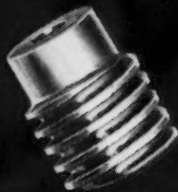




CLOSE TOLERANCES ( $\pm .0001''$ ) and the need for easy, low-cost machining called for Carpenter Stainless No. 5 bar stock on precision parts for the Norden bombsight



FREE-MACHINING Stainless Steels were invented by Carpenter. And easier machining reduces rejects, cuts costs on jobs like this finned spark plug.



FEWER REJECTS on your precision jobs like these torpedo mechanism parts will mean lower unit costs, as well as improved performance for your products.



# Improve PRODUCT PERFORMANCE Lower YOUR UNIT COSTS

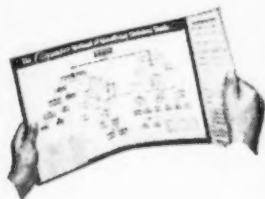
where you use *Stainless Steel!*

Even Stainless Steels of the same analysis aren't all alike. And the differences become most apparent when you start fabricating them. Where one Stainless will be troublesome to machine, another will cut freely.

The difference can be traced to the care and quality control that goes into the making of each Stainless Steel.

When Stainless is made under the rigidly controlled conditions of a tool steel mill only the finest quality can result. And that's just how Carpenter Stainless is made. When you add the advantages of Carpenter's pioneering research—Free-Machining Stainless Bars and ductile Stainless Strip—you have the most uniform, easy-working Stainless Steels available.

You can start now to reduce the cost of using Stainless... by specifying "Carpenter" on your orders for Free-Machining Stainless bar stock. Standard sizes are available for immediate delivery from warehouse stocks. And don't hesitate to call in your nearby Carpenter representative. He can give you useful hints to help get jobs done at less cost.



## ... ANOTHER REAL HELP FOR STAINLESS STEEL USERS!

*A Handy Method for  
Identifying Stainless Steels*

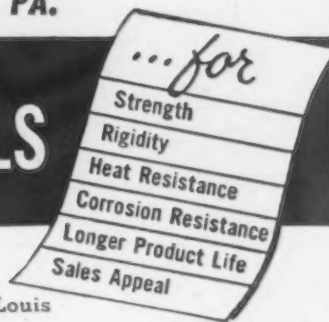
Even in the best regulated plants, steel stocks sometimes do get mixed. And you know the troubles a mix-up can cause in heat treating, machining, stamping, welding or other Stainless fabricating operations. To help you eliminate this problem, the Carpenter Laboratories have developed this chart which explains 8 different tests for identifying various types of Stainless. It shows when and how to use each test. To obtain a copy, simply send us a note on your company letterhead. Write today.

THE CARPENTER STEEL CO., 121 W. Bern St., READING, PA.

# Carpenter STAINLESS STEELS



BRANCHES AT  
Chicago, Cincinnati, Cleveland, Detroit, Hartford,  
Indianapolis, New York, Philadelphia, Providence, St. Louis



• **Steel industry disturbed over wage demands Lewis may make for UMW . . . Higher steel prices may be requested.**



**W**ASHINGTON—It is just one headache after another for the steel industry. Still groping its way out of the entanglements of higher wages and limited price increases, the cost of settling the CIO-USW strike, the industry is immediately faced with another big worry.

It is fretting itself over the forthcoming new labor coal contract. This means dealing with the ablest and most formidable labor leader of the country, John L. Lewis, head of the United Mine Workers, who has returned to the fold of the American Federation of Labor, or vice versa. There is a division of opinion whether Mr. Lewis has again lined up with AFL President William Green or whether Mr. Green has joined up with the more dominant Mr. Lewis.

Undoubtedly in negotiation with USW President Philip Murray and government representatives in an effort to settle the steel strike, steel interests gave much thought to what it will cost to dig coal out of captive mines, operated on a closed shop basis, thanks to the skillful and insistent Mr. Lewis. It is conceivable that Mr. Lewis has been sounded out to see what he proposes to do about new coal contracts effective Apr. 1. But if he was approached on this important subject and he disclosed his plans or any part of them, the

information has not been publicly revealed.

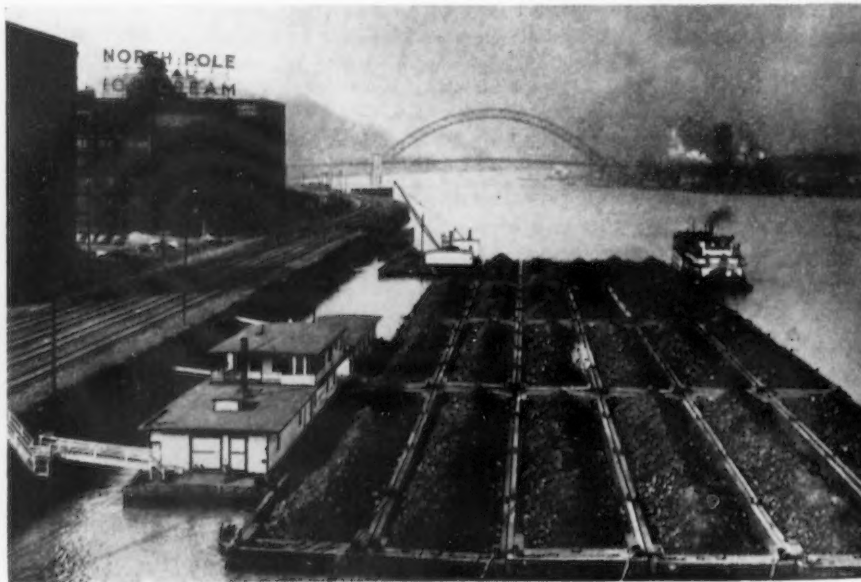
What Mr. Lewis may demand and what he may get in the way of further concessions obviously has a vital bearing on steel costs. If they again are upped, steel manufacturers will have to appear at the OPA threshold, its welcome sign turned upside down, and rap loudly. Granted reluctant admission, steel producers will have to ask for another boost in steel prices, without waiting for the six-month cost-price review. Holding that increases it has been allowed are inadequate, the industry certainly would demand further relief if burdened by additional costs. And as stiff as Economic Stabilizer Chester Bowles and Paul Porter, Mr. Bowles' successor as head of OPA, may be, it is not possible to see how they could turn thumbs down on the demand unless the government itself took over, something that President Truman definitely does not contemplate. Rising costs and prices that will be inevitable as the result of rising wages, together with slashed production, are clearly the prime element that has set in motion the spiral of inflation and if they are to shoot upward again it

will give it a lusty spin that will head it dangerously toward disaster.

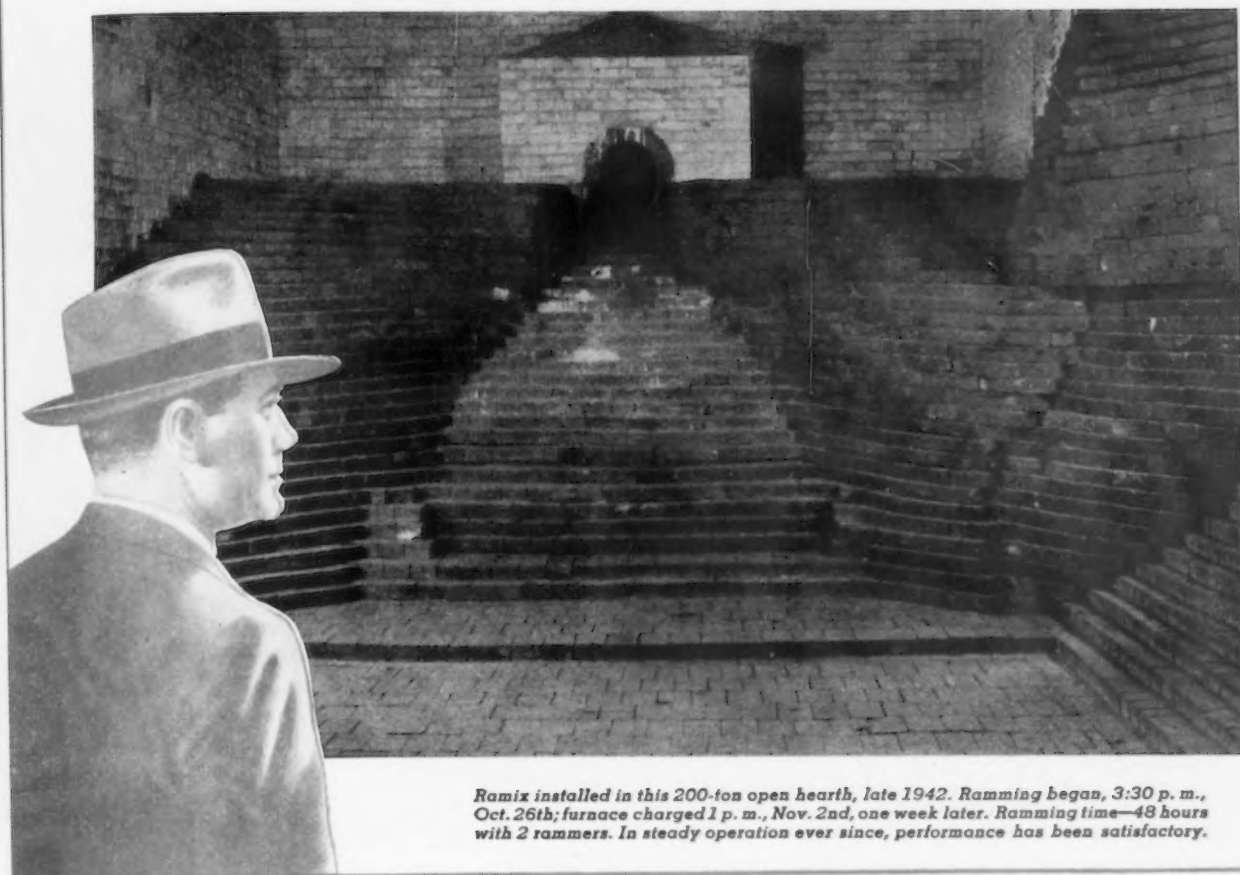
At the same time labor, though it undoubtedly has overstretched some of its demands, has reason for asking wages that match living costs. They have increased 33 pct over the prewar period. Fuzzy, bewildering and economically contradictory as it may be, that is why the administration's policy now provides for wage increases of approximately 18 pct, the difference between the 33 pct cost of living increase and the Little Steel formula providing for a 15 pct wage boost. But it may be added that there are much stronger brakes on price increases than there are on wage increases.

There is more rather than less confusion over the situation and even in the government there is deep, though concealed concern, over what may be ahead. It is hoped that the tangle will be straightened out, but at present there is grumbling and criticism by both management and labor. The way out is far from clear but at least it is commonly realized, except by the more radical element, that one main path is improved technique, increased productivity with concomitant re-

**SIXTY-FOUR DOLLAR QUESTION:** Most steel officials would be either happy or unhappy to know for sure what the coal miners' demands will have in store for them by Apr. 1. If a strike occurs coal barges like these will take a vacation and maybe the steel mill in the distance will do the same. Stocks are still low.







*Ramix installed in this 200-ton open hearth, late 1942. Ramming began, 3:30 p. m., Oct. 26th; furnace charged 1 p. m., Nov. 2nd, one week later. Ramming time—48 hours with 2 rammers. In steady operation ever since, performance has been satisfactory.*

## GETTING AT THE BOTTOM OF **BOTTOM TROUBLE**

**M**ORE and more operators are eliminating serious bottom trouble by using Ramix. The number of Ramix open hearth bottoms in successful use has grown to well over 300—approximately one third of the country's basic open hearth steel capacity. Counting also the 200-odd electric furnace hearths of Ramix, this means over 25 million tons of steel poured from Ramix bottoms in 1945.

Eight years of service, particularly under the severe operating conditions of the war period, have amply proven the dependability of this cold ramming refractory. The first Ramix hearth ever installed, in a 100-ton furnace in 1938, is still in service. In another plant, the open hearth superintendent reports that

one of his Ramix-hearth furnaces, shut down for six months, has been put back into operation, without any bottom trouble. Ramix hearths have been successfully installed in the country's largest open hearth and the smallest, as well as in the largest and smallest basic electric steel furnaces.

The success of a cold-rammed bottom depends on three important factors: (1) use of the right material; (2) correct installation procedure; (3) good maintenance practice. Basic engineers, guided by the company's long experience in developing, manufacturing and servicing Ramix, welcome an opportunity to consult with you at any time, to help you get at the bottom of your bottom troubles.



**BASIC REFRACTORIES, INCORPORATED**

845 HANNA BUILDING  
*Cleveland 15, Ohio*

duced costs, lower prices and volume markets.

In any case it may be taken as a certainty that Mr. Lewis naturally will demand that his miners get the advantages of the wage policy and he may settle for that—or he may not. Mr. Lewis is unpredictable, except on one thing. He looks out for UMW and has had high success in that direction. Aside from this, he may quite often be talking and acting like a conservative industrialist, accepting the latter's economic views on the necessity of full production and even long hours under certain conditions, or Mr. Lewis can be rabid. He is not superficial. Much as he enjoys it, he doesn't indulge in oratory just to hear his own voice. What he says has meaning as well as euphony. He is rated as a good economist, as well as a most competent labor leader, who has a down to earth knowledge of industry, especially the coal industry which he knows from its portal to its deepest pit. That is one reason why he is a tough customer to bargain with when he wants to be difficult as he often does.

So Mr. Lewis may be ready or he may not be ready to compro-

mise on new demands that he is expected to make. Generally demands exceed realities that go into contracts. While he is not telling the world what he has in mind, a pattern is being drawn which has aroused fears that UMW will settle for less than it likely will ask but the question is whether it will soften the demands to a point that will be acceptable to operators, even if they are prodded by the government.

The outstanding demands that appear to form the pattern that is in making have come from UMW's District 5, centered in the Pittsburgh area, one of the most important in the country. Officers of this District union stick close to Mr. Lewis' policy. This District's demands are on the side of bigness. It is demanding the same pay for a 35 hr week as its members are now getting for 48 hr, estimated to mean a \$1.50 to \$2 daily wage increase. It wants for its welfare fund a 10¢-a-ton royalty on coal production. It wants to increase its present vacation pay of \$75 to \$100.

To whatever they may simmer down, these demands show strikingly that the steel industry is faced with still higher costs.

## No Proposals Made To Abolish Maintenance, Check-Off Provisions

Chicago

• • • Abolition of maintenance of membership and check-off provisions in contracts of basic steel producers with the United Steel Workers of America (CIO) never was proposed by company representatives in any of the major conferences leading to settlement of the strike, David J. McDonald, secretary-treasurer of the union, said here recently.

During the negotiations it had been rumored that some companies would insist upon elimination of these contract provisions as a condition of approving the wage settlement.

"Some employers made an attempt to smash the unions but they were unsuccessful. We hope they will accept the fact that organized labor is here to stay and is an integral part of the economic system," Mr. McDonald said in hailing the strike as "successful" from the union point of view.

Mr. McDonald declared that the strike had been carried out without "untoward incidents" and expressed satisfaction with the manner in which the walkout had been conducted.

Referring to suspension by Carnegie-Illinois Steel Corp. of foremen in Chicago district plants who joined the walkout he said that "the international union has talked with the company and has been assured that they would try to clean it up." (The company states that it has commenced individual hearings for each foreman involved.)

The union official asserted that the United Steel Workers now is the largest union in the world, having passed in membership the United Auto Workers, which previously claimed to hold the number one position.

Full production by the steel industry in from 10 days to two weeks following the end of the strike, was predicted by Mr. McDonald.

The union reported settlements with U. S. Steel Products Co. and U. S. Steel Supply Co., drum fabrication and warehouse subsidiaries of U. S. Steel Corp., respectively.

## THE BULL OF THE WOODS

BY J. R. WILLIAMS





# SHEFFIELD Crush-Dressed GRINDING IS FASTER

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October 1, 1945

Mr. C. J. Linxweiler, Mgr.  
Machine Tool Distribution  
The Sheffield Corp.  
Dayton 1, Ohio

Dear Mr. Linxweiler:

Yes, of course. You have our permission to use the photograph sent you and we are very pleased to advise that our Sheffield Precision Thread and Form Grinder has been in constant use for well over a year on production of Class 3 ground threads for the aircraft industry. Production with the multiform crush dressed wheel is many times faster than with conventional single point grinding, even on the hardest of materials.

If we can be of any further assistance, please advise.

Yours very truly,  
ZAGAR TOOL, INC.

*F. Nadon*  
F. Nadon  
Sales Department



• Steel strike starts all over again for Columbia . . . 700 miles of pipe sold by WAC . . . Northwest looks forward to operation of aluminum plants.



**S**AN FRANCISCO—Steel producers may well wonder if they are sitting in a game of "Texas poker"—a game in which the rules change during every hand to suit the convenience of organized labor. The walkout of 2600 employees of the Columbia Steel Co. plant at Pittsburg only four days after the end of the month-long USWA strike apparently shows the employers holding a small pair instead of the royal flush "no strike" contract they thought they had been dealt.

Officials of the company reported that the strike actually started when the openhearthers were ready to receive their first charge after the end of the national walkout. Finishing facilities had been in near normal operation for three days while the furnaces were heating, and when charging operations were to be started two charging machine operators failed to show up. The union claims these men stayed off the job because the company had designated one of them as a utility man rather than an operator and that the work ordinarily required two full-fledged operators. The company reports that one man was considered sufficient because only four furnaces were to be put into operation and that before the war this number was fed by one operator.

Openhearth production was

stopped cold as a sympathy walkout of 300 men cleared the floor and then the entire plant was forced to close as all employees went out last Friday. Plant Superintendent Joe A. White, his assistant J. D. McCall and industrial relations supervisor Paul Dragon were prevented from entering the plant Friday by union pickets. Explaining that the visit was essential to check on possible damage to the furnaces, the picket captain told the officials that they would have to get a pass from union headquarters.

Company spokesmen said: "We are willing to employ the two workers, at least until a decision can be reached as to whether the fifth furnace will be put into production, but the men have filed no grievance. Despite the 'no work stoppage' clause in our contract, they just refused to work. Now, because our contract states that no negotiations will be conducted in the event the men are off the job, we can't even discuss the matter with them."

The head of Local 1440, USWA replied: "We will return to work only when previous working conditions are established."

The Torrance plant of Columbia has not been affected and production is nearing normal. Operations at the Bethlehem plants on the Coast are expected to be at capacity within the next week.

The local steel fabricating plants which have been fortunate enough to escape closure because of the still existing machinists' strike are working as near capacity as limited stocks of structurals will permit. There is a general belief among fabricators that part of the increased labor costs brought by recent wage disputes settlements and higher steel costs will be recovered through authorization of higher prices.

\* \* \*

**T**HE San Francisco Regional Office of the War Assets Corp. last week completed the sale of approximately 700 miles of 6 in. O. D., 12 gage, "invasion" pipe for approximately \$1 million. Thousands of miles of this material had been used by the armed forces for the conveyance of gasoline, water and

oil to keep its motorized units supplied in both the Pacific and European theaters. Made up in 20-ft lengths and equipped with rings for assembly into lines by means of Victaulic or Gruvagrip couplings, the pipe is readily portable. Each length weighs approximately 154 lb per length.

Manufactured locally, the pipe just sold had been stocked in Oakland for use in the proposed invasion of Japan, but was turned over to WAC in new condition.

Morse Bros. Machinery Co. of Denver; Dulien Steel Products Co. of Seattle, Portland and Los Angeles; and Pacific Pipe Co., Oakland, were successful pool bidders on 2,891,120 ft of pipe and 145,485 couplings with an offer of \$828,234. According to a spokesman for the group they will offer this material for sale throughout the West.

The next largest lot went to A. Wardman of Fullerton, Calif. He entered a bid of \$146,916 for 528,000 ft of pipe and 26,400 couplings which he is reported as planning to use for irrigation near Bend, Ore.

The butt welded pipe is uncoated and that portion to be re-sold by the pool is being offered as is, or dipped, or dipped and wrapped, according to Max Grimes, general manager of Morse Bros. Machinery Co. Louis Dulien, president of his company and M. Jacobs, president of Pacific Pipe represented the other two members of the pool.

Considerable impetus is being given to disposal of war surplus through WAC with advertisements appearing in California newspapers and direct mail campaigns offering \$25 million worth of miscellaneous materials from Port Hueneme. Included in the offerings which go on sale at fixed prices between Feb. 27 and Mar. 29 are general hardware, hand tools, machine tools, welding supplies, steel shapes, aluminum sheets, tanks, pumps, engineering supplies and millions of dollars worth of miscellany. Conspicuous by their absence are extremely scarce steel sheets and lumber.

In spite of the upset industrial picture in northern California with



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**P**ROGRESSIVE Kearney & Trecker Corp., Milwaukee, Wisc., reports the following savings by TOCCO hardening the above saddle clamp eccentric of their Milwaukee Milling Machine:

	FORMER METHOD	TOCCO
Heat treating.....	\$ 0.721.....	\$ 0.099
Straightening.....	0.752.....	0.000
Cleaning.....	0.100.....	0.000
Total Cost.....	\$ 1.573.....	\$ 0.099

**Saving . . . \$1.47 per piece**

In addition to this saving of \$1.47 per piece, TOCCO made possible a switch from alloy steel

to S.A.E. 1045 steel, saving \$0.110 in material cost per piece.

Total saving on each run of 1375 pieces for this one part is \$2,172.50.

Kearney & Trecker hardens a total of 140 different parts on one "TOCCO JR." machine. Output of some parts has been increased as much as 500%.

Why not enlist TOCCO's experienced Engineers to help you obtain similar improvements for *your* production? New booklet, "Results with TOCCO", gives ideas for hardening, brazing, annealing, heating by TOCCO Induction.

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THE IRON AGE, February 28, 1946—77

machinists still out, longshoremen and shipyard workers showing signs of unrest and canneries caught in a row between AFL and CIO, there are many indications that there is a basic optimism pervading the long-range thinking of businessmen. The San Francisco Chamber of Commerce' figures on business expansion in this area show that during 1945 \$118 million was invested by industry and that \$83 million was similarly applied in the Los Angeles area.

A few of the newer enterprises which are contributing to this growth are: Joseph T. Ryerson & Son, Inc. which is reported ready to put in a \$750,000 distribution plant in Emeryville on land already purchased; Earle M. Jorgensen Co., which is building new steel warehousing facilities in Oakland at a cost of approximately \$250,000; Matson Navigation Co.'s contract with the Netherlands Purchasing Commission for conversion and overhaul of four-engined planes at Oakland; entry of National Automotive Fibres, Inc. into the upholstered furniture business in Oakland as a supplement to its automotive upholstery work; start of construction of San Francisco's \$4 million apparel center; and start of construction of the \$21 million contract on Davis Dam by Utah Construction Co. of San Francisco early in March.

The paucity of office space in the city has been a handicap to many companies eager to open branches here. The Chamber of Commerce has reported to the Board of Supervisors that Federal agencies now control approximately 21 pct of the total office space in major buildings of the city and that efforts are being made to have as much of this space released as possible. It has been estimated that this is just about the amount of office space needed by new enterprises.

**SEATTLE** — The announcement that Henry J. Kaiser interests have been granted leases on the Mead aluminum reduction plant and the Trentwood aluminum rolling mills was received here with mixed enthusiasm.

While the Northwest has been clamoring for operation of these facilities there are some who express doubt that Mr. Kaiser and his organization without experience in the field will be able to utilize the mills to fullest extent and thus provide maximum employment. However, others point out that the same expressions of doubt prevailed at the start of his Fontana, Calif., steel operations and that to date that plant has been operating with full employment. Mr. Kaiser has announced that the entire production of the aluminum rolling mill will go into Kaiser-Frazer

automobiles and that the plants "will be operated to the fullest possible extent." Persons close to Mr. Kaiser state that he will have both operations going full blast within a month or two.

Opening up of these two plants should go a long way to reduce Bonneville Power Administration's surplus of some 500,000 kw of power reported this month by Administrator Paul J. Raver in his annual statement to the Secretary of the Interior. A summary of Bonneville's revenue shows that for the fiscal year ending June 30, 1945: \$36,188,589 was derived from sales of power to the light metal industry; \$8,299,162 from other industries; \$1,057,801 from military establishments; \$5,910,277 from publicly-owned utilities; \$11,904,553 from privately-owned utilities; and \$216,860 from other sources.

At least one local strike has been cleared up. The Washington Metal Trades machinists have reached a settlement with their employers and 47 metal working shops are back in business. The new wage scale is: Tool and die makers \$1.65 an hr; machinists \$1.43 an hr; specialists \$1.22 an hr; and helpers \$1.05 an hr.

Northwest Steel Rolling Mills, Inc. is now going into two shift operation which had been planned for Feb. 1. During the war the plant was unable to get enough men to work the double shift.

**TAKE YOUR PICK:** Several million dollars worth of government surplus war materials, ranging from giant wrecking trucks, which are shown here, to such things as alarm clocks, were to be offered for sale at the War Assets Corp in Port Hueneme, Calif.



## Prestrike Employment Rate Shows Stability

Buffalo

• • • Factory employment in 173 area plants was almost unchanged from Dec. 15 to Jan. 15, before the steel strike knocked the props from under the labor index, the Buffalo Chamber of Commerce reported. The total was 71,966 on Jan. 15, against 71,875 on Dec. 15, 1945, and 113,318 on Jan. 15, 1945.

Average weekly payrolls of the plants were \$3,548,660 in the December-January period, compared with \$3,544,730 in the November-December period and \$6,402,869 from mid-December through mid-January a year ago.

Average weekly earnings of workers in the 173 plants were \$49.31 against \$49.32 a month previous and \$56.50 a year ago.





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Scientists have made many guesses as to how long the seas of the world will last. Some think they will last forever. There is little guessing, however, as to how long Harper non-ferrous and stainless fastenings will last . . . they will far outlast the assemblies in which they are used. Even in corrosive chemicals they will outlast common steel because . . . Harper Everlasting Fastenings are made exclusively of Brass, Copper, Naval Bronze, Silicon Bronze, Monel Metal or Stainless Steel and will not rust or corrode.

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A stock of over 5000 different types and sizes of bolts, screws, nuts, washers and other standard items assures fast delivery of your orders. Specials are engineered and produced from raw materials on hand for speedy fabrication. Ask for our 120-page 4-color catalog for easy reference.

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# European Letter . . . JACK R. HIGHT

• Progress on settlement of German steel industry future delayed . . . Four powers discussing master plan for governing Germany . . . Decision not expected for some weeks.



**B**ERLIN—Progress toward the ultimate settlement of the future of the German steel industry is being delayed by the decision to first establish in some detail the overall standard of living for Germany. The Four Powers are carrying on detailed "level of industry" discussions which will ultimately result in a master plan for the governing of Germany, but the plan is not expected to be complete for some weeks.

Indecision among the occupying powers as to the propriety of the "agrarian Germany" concept as evolved in the Potsdam Declaration has rendered announced conclusions in regard to the steel producing and consuming industries practically worthless. Adding to the general confusion as to what the industry will amount to during the postwar period was a Four Power announcement some weeks ago to the effect that as far as ingot steel production was concerned an agreement had been reached. The decision as announced, called for a rated capacity of 7.5 million metric tons per year, and an annual output of not more than 5.8 million tons.

Although not willingly admitted among the high American military government officials here, it seems certain that the above announcement was extremely premature. The British have raised strong objec-

tions to the above interpretation of the future production, and there is much confusion as to why the "agreement" was ever announced. According to British officialdom it was one of the unfortunate results of a faulty translation on the Four Power level, and such a mistake is certainly quite possible.

The result of the negotiations which are again underway seem certain to be a general raising of the sights for steel production, in line with British ideas. Informed opinion in Berlin at this writing is that the new output limit will be about 7.5 million tons with a rated capacity of about 15 pct above that. This opinion discounts the fact that according to a press release by Brig. Gen. W. H. Draper, director of the economics division of the American military government, the 7.5 top limit first announced will in fact prevail.

Without presenting a too alarming picture or predicting a breakdown in the Four Power negotiations on the steel issue, it seems certain that the report by General Draper on the status of the economic agreements was over optimistic as to the breadth of agreements. According to his statement, steel productive capacity in excess of 7.5 million metric tons in Germany is available for reparations. Actually, although some steel production has been earmarked for reparations, the amount involved is not reaching down to the 7.5 level until further agreement is reached.

While, as he stated, there is general agreement that there will be no heavy machine tool production in the future Germany, there is as yet no decision as to what constitutes a "heavy machine tool." Similarly the decision to forbid ball and tapered roller bearing production seems to have been reopened, due to a general unavailability in the world market. The general did point out in his report that all of the understandings reached may be subject to further revisions in light of the need to balance Germany's exports and imports, and all of the above items might be included in that conditional clause.

The preliminary report on the status of the overall reparations program indicated a number of in-

dustries that are to be permitted to operate only to the level of the country's domestic needs, including automobiles, trucks, buses, heavy electrical and metallurgical equipment, heavy construction equipment, locomotives, freight and passenger cars, and light machine tools. Machine tools are being considered with extreme caution as the cornerstone of Germany's warmaking potential.

In the above lines much work must be done in the determination of the precise minimum domestic needs for any year, and negotiations are underway for this purpose.

The groups of Americans that are at present discussing the establishment of future policies are in many cases here on a temporary basis, to remain until the broad policies for the future have been established. The future operation of the policies will be handled by new groups, probably now being assembled, whose stay in Germany will be more permanent. The transition should come about this spring, with the establishment of a small group to insure that the policies are adhered to as laid out, but the actual operations will be turned over to the Germans.

The inability of the level of the industry committee and the rest of the economic division to announce a Four Power agreement settling all reparation questions by the target date of Feb. 2 was not unexpected here, despite the mandate of the Potsdam Declaration that the work should be done by that time. The often emphasized difficulties of working in many committees on a Four Power basis make all progress slow, and forward steps on highly controversial issues few and far between.

The discussions are going on constantly, however, as far as the metals issues are involved, and all continue to be on a very high plane. The members of the committee are painfully aware of the import of their decisions, so much so that the air in any meeting is heavy, and there is a constant effort from all sides to brighten the proceedings when possible. The language difficulties make the passing off of any lighthearted remark a trilingual



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**1927** A. O. Smith has always been alert to the possibilities of new alloys and new metals. When stainless steel was produced, A. O. SMITH welding laboratories promptly developed a stainless steel electrode. The result was a weld that preserved all of the new alloy's corrosion-resistant properties.

**1946** Welding research that has been continuous since 1917 stands behind the virtually constant flow of stainless steel vessels from A. O. Smith plants. Constructed in all sizes, often of intricate design, and made of solid alloy or with stainless steel linings, SMITHway Welded Pressure Vessels are in high-corrosion service the world around.



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The Proof Is in Production . . .  
*The Proof Is in Service*

A stainless steel electrode may have all of the necessary physical properties; it may be a delightful tool for the welder to use; it may even cost less than half of some other electrode—but it may be a disastrous investment for the fabricator if the weld fails after months or even years of service.

That's why SMITHway Certified Electrodes are specified for most "particular" jobs. Large volume operators recognize that there is no substitute for the extensive A. O. Smith laboratories in controlling and maintaining the *chemistry* as well as the *metallurgy* of stainless steel electrode metal. And large volume operators take no chances that a ten-cent economy today may cause a thousand-dollar failure in service two years, five years, or even ten years from now.

Everywhere farsighted management is studying how welding—the modern production tool—permits improved design, cuts cost, simplifies production.

SMITHway  
A. C. Welders  
a Complete Line

Six models, including three new models of 150-, 200-, and 250-ampere capacity. Heavy Duty Models of 300-, 400-, and 500-ampere capacity. Write for complete specifications and prices.



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**WELDING ELECTRODES**  
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matter, and then it usually becomes useful to explain in Russian and French why it is that the remark although in English may be funny only to the Americans. If a Russian rejoins that that is a good one but he heard one slightly different, the three translations begin once more.

Despite the agreements yet to be reached, the industry questions have not reached the impasse stage that the centralized government problem has. The work that is be-

ing done in Berlin is done on several different levels, and only on the central government issue has the highest council, consisting of the four military governors, indicated an inability to reach a decision. If the groups meeting in Berlin cannot reach agreement on the steel industry or on the broad level of industry question, then the military governors will so indicate to their respective governments, and the issue would be taken up on the basis of diplomatic discussions.

### Canadian Firm Signs Contract with Baldwin

Toronto

• • • United Steel Corp. has made a long-term contract with Baldwin Locomotive Works of Philadelphia, to manufacture its machinery and equipment in Canada — hydraulic presses, diesel engines, turbines and other apparatus, according to Canadian officials. It also is stated that the Kaiser-Fraser interests are negotiating for production of their cars in Canada, and that certain car parts for the Kaiser-Fraser cars will be manufactured by United Steel Corp.

United Steel has completed plans for wider distribution of its iron and steel, etc., and with this object in view has acquired four new steel warehouses — at Toronto, London and Welland in Ontario and at Montreal, Que., all of which are strategically located to serve the big iron and steel markets in these localities. United Steel Corp., plans to become one of the largest distributors of steel in Canada. Officials state that reconversion problems will not interfere with production of present lines or development of new ones. Substantial business already is on hand, including orders from Russia.



• • •  
BRITAIN RE-BUILDS RAILWAYS: Great Britain has tackled the job of replacing depleted and heavily worn railway equipment and has also undertaken the production of a new line of "1000 Class" locomotives. Much of the metal for the castings has been smelted from scrap engines and old parts. Here the boiler and firebox assembly is being lowered onto the chassis.

### Canada's Steel Export Dollar Volume Drops

Toronto

• • • Canada's exports of nonferrous metals and their products were valued at \$352,500,000 in 1945, compared with \$339,900,000 in 1944, the Dominion Bureau of Statistics reports. The total for non-ferrous metals and their products for 1945 include the following: Aluminum, \$135,500,000; brass, \$4,360,000; copper, \$40,860,000; lead, \$9,180,000; nickel, \$54,780,000; precious metals, except gold, \$17,200,000; zinc, \$20,370,000; other nonferrous metals, \$10,330,000.

Exports of iron and steel and their products in 1945 were valued at \$555,000,000 compared with \$772,900,000 in the year immediately preceding. The largest part of these exports was made up of vehicles.

Exports of non-metallic minerals and their products for 1945 were valued at \$59,500,000 against \$58,400,000 in the previous year, and nearly half of this total consisted of asbestos.

Production of silver in Canada during 1945 amounted to 12,778,859 fine oz against 13,627,109 oz in 1944.

Production of unrefined lead in all forms amounted to 349,169,558 lb compared with 518,866,285 in 1944; and output of primary zinc in 1945 amounted to 518,866,285 lb compared with 550,823,353 lb in 1944.

### Deere's Income Drops

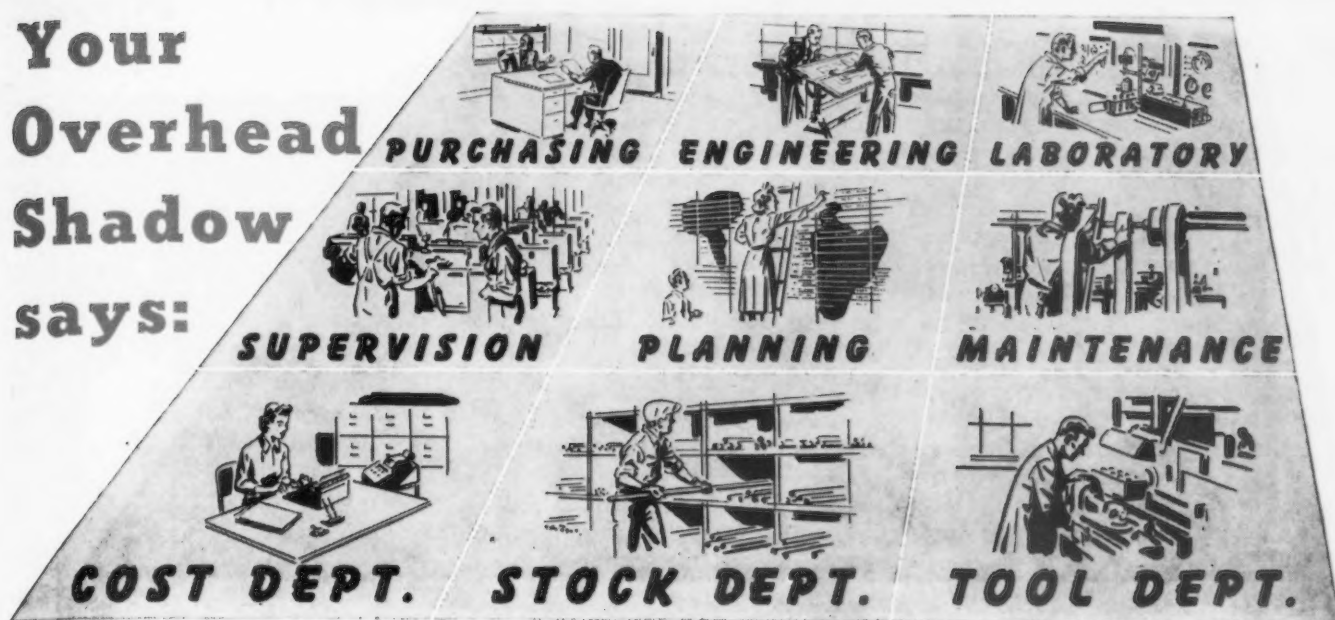
Chicago

• • • Net income for the 1945 fiscal year of \$8,650,439 is reported by Deere & Co., farm equipment manufacturers, compared to \$10,779,416 in the 1944 fiscal year.

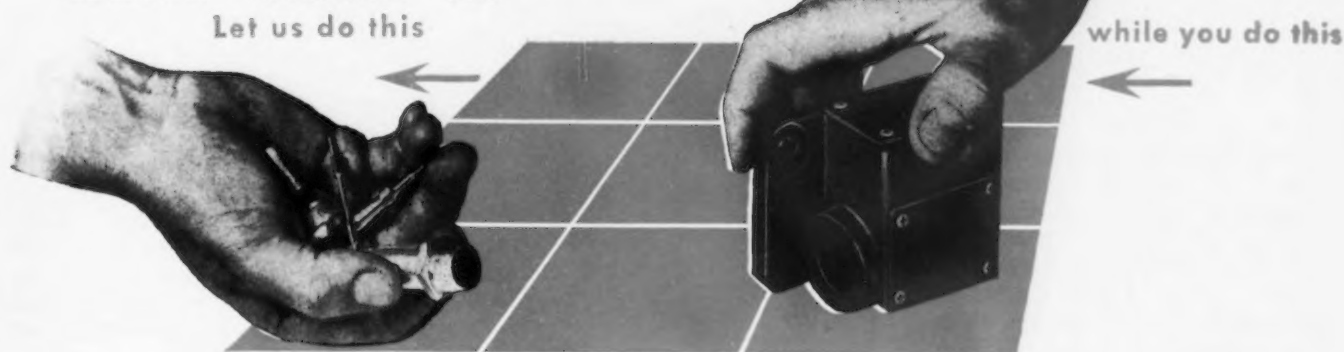
Increased cost and a decline in net sales from \$171,161,672 in 1944 to \$137,742,796 in 1945 contributed to the lower income. With farm equipment sales on approximately the same level in both years, reduced sales of war products were indicated as the principal reason for decline in overall sales. About \$21 million in war goods was produced in the 1945 fiscal year.



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Shadow  
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**"When you can buy it,  
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CORBIN SCREW specializes in precision mass production of small parts. We have M<sup>3</sup> Facilities — Men, Materials, Machines, with years of experience in knowing *how* to do a job thoroughly and economically. We can act as your small parts department — operate on a schedule that will keep ahead of your needs — change over to new patterns at the drop of a hat, if need be.

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P-2



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# PERSONALS

• • •

• **A. J. Kerr**, formerly general sales manager, has been elected vice-president of sales of the Rockwell Mfg. Co., Pittsburgh. He has been associated with the company for more than 20 yr. His early career was as district manager, Tulsa office of the Pittsburgh Equitable Meter and Nordstrom Valve Co., now divisions of the Rockwell Mfg. Co. In 1944 he was made general sales manager.

• **G. F. Reznor**, son of the founder, succeeds the late **William M. Graham** as president of the Reznor Mfg. Co., Mercer, Pa. Mr. Reznor has been with the company for 40 yr and is largely responsible for the advanced engineering and design of Reznor heaters. **Dave Webster** moves up to vice-president and general manager. He has been with the company since 1926, starting as a representative in Philadelphia and has been sales manager since 1931.

• **George L. Collord**, vice-president and director of the Shenango Furnace Co., Pittsburgh, has retired after many years of service.

• **Earl L. Coppock** has been named manager of the sales promotion dept. of Packard Motor Car Co., Detroit, and will supervise all company sales promotion activities. Prior to his service with the Navy, Mr. Coppock was affiliated with a major automotive division for 9 yr, during which time he served in the Salt Lake zone in executive capacities, including district manager, sales promotion manager, and assistant zone manager, and for 3 yr as assistant national sales promotion manager in Detroit.

• **Charles A. Reinbolt, Jr.**, who formerly handled sales promotion for the American Central Mfg. Corp., Connersville, Ind., has been appointed advertising and sales promotion manager of the corporation.

• **George P. Torrence** has resigned as president of Cleveland Pneumatic Tool Co., Cleveland, and **John S. Clark** has resigned as vice-president and treasurer. Prior to joining Cleveland Pneumatic, Mr. Torrence was vice-president of Rayon Machinery Co. Previously he had been president of Link Belt Co., Chicago.

• **Russell L. Peck** has been appointed refractories engineer by Norton Co., Worcester, Mass. He will work with F. E. Leiby and will cover Philadelphia, Delaware, Eastern Maryland, Eastern Virginia and Eastern North Carolina.

• **Col. Harold A. Tenney** has returned to the National Iron Works of San Diego, Calif., as assistant comptroller. In his new position he will serve as first assistant to John A. Davis, vice-president and comptroller of the company.



**WILLIAM P. GETTY**, assistant to manager of raw materials, Jones & Laughlin Steel Corp.

• **William P. Getty** has been appointed assistant to the manager of raw materials for the Jones & Laughlin Steel Corp., Pittsburgh. Mr. Getty's entire business experience has been with the steel industry. He was associated with the Weirton Steel Co. for 3 yr and has been with Jones & Laughlin since 1936. Prior to his present appointment he was affiliated with the metallurgical dept. of the company.

• **D. P. Samson** has been appointed manager of foundry sales and will be in charge of sales of foundry products and wheels for the American Car & Foundry Co., New York. He succeeds **G. A. England** who has transferred to the Operating Div. of the Foundries and will be located at St. Louis.

• **Bernard J. Erskine** has been appointed manager of parts sales of Sylvania Electric Products, Inc., with headquarters in Emporium, Pa. Mr. Erskine has been with Sylvania since 1934, except for the last 3 yr which he spent in the Navy.

• **John B. Sutton, Jr.** has become affiliated with Machine & Tool Designing Co., Philadelphia, in the mechanical engineering and designing field, with headquarters in Pittsburgh. Mr. Sutton joined the company upon his release from the Army. Prior to that time he had been associated with Sutton Engineering Co., Pittsburgh.

• **David W. Odiorne** has been appointed railway engineer by Edgewater Steel Co., Pittsburgh, with headquarters at the company's home office in Oakmont, Pa. Mr. Odiorne was employed by the New York Central Railroad for 19 yr, and obtained extensive training and experience in practical railroad engineering with that organization.

• **James Ferguson**, long associated with the General Box Co. as sales and production manager of the Kansas City office, has been promoted to the position of sales manager. Mr. Ferguson, who is to be located in Chicago, will work directly with N. A. Fowler, director of sales and research for the company.

• **Maj. O. W. Schmidt** has been appointed national sales manager of the Shafer Bearing Corp. of Chicago.

• **G. W. Birdsall**, editor and technical writer, has joined the Reynolds Metals Co. as editorial dept. manager, with headquarters in Louisville. Formerly staff editorial feature writer for *Steel* magazine before joining Reynolds, he will supervise the publication of company technical magazines and the preparation of technical articles for national magazines in metalworking and associated fields.

• **Charles B. Wiggin** has been elected vice-president and general sales manager of the National Can Corp., New York. Mr. Wiggin is also a director and treasurer of the corporation and will continue in these capacities.



## PERSONALS



**JOSEPH C. WALKER**, president,  
Buffalo International Corp.

• **Joseph C. Walker** has been named president of Buffalo International Corp., newly formed, with headquarters in New York, as the foreign trade subsidiary of the Buffalo Bolt Co. of North Tonawanda, N. Y. Mr. Walker also is Buffalo Bolt's New York district manager.

• **James S. Heath** has joined the American Steel Warehouse Assn., Inc., Cleveland, to assist in all general association activities.

• **Frank D. Newbury**, who started work with the Westinghouse Electric Corp., Pittsburgh, in 1901 as an apprentice engineer and rose to become a vice-president, has been elected a member of the company's board of directors.

• **Kenneth K. Boynton** has been elected vice-president of International General Electric Co., Inc., of New York. Mr. Boynton will be in charge of I.G.E.'s relationships with associated companies in Europe, and will be the senior representative for all the company's business there.

• **William H. Summers**, former Washington district manager for the Mechanical Goods Div. of the Goodyear Tire & Rubber Co., has been transferred to Cleveland in a similar capacity, replacing **R. E. Britt**, district manager, who is leaving the company to head up the Central States Industrial Supply Co., new Goodyear jobber in Cleveland.

• **Allen D. Pettee** has been named chief electrical engineer of General Cable, New York.

• **D. A. Samson**, wartime operating manager of the De Soto Warren plant of Chrysler Corp., has been named budget director of the corporation.

• **A. J. Cayia** has been appointed vice-president and general manager of Inland Lime & Stone Co., with headquarters at Manistique, Mich. He will be in charge of all phases of the operation of the company. Mr. Cayia has been associated with the Inland Steel Co. subsidiary since 1928.

• **R. P. Kytte, Jr.** has been made manager of planning, Reynolds Alloys Co., a Reynolds Metals subsidiary, with headquarters at Listerhill, Ala. Prior to acting as technical advisor for the Reynolds Aluminum Div. in Louisville, he was superintendent of the Reynolds Alabama sheet mill. Before joining Reynolds, he served for 6 yr in various capacities with the Aluminum Co. of America.

• **W. M. Stevenson** has been appointed manager, western railway dept. of the Crucible Steel Co. of America, with headquarters at Crucible's Chicago branch office. Previously Mr. Stevenson was for many years a sales and service engineer of the Railroad Div. at the Cleveland branch.

• **J. R. Lawrence** has been appointed representative of the Iron & Steel Products, Inc., in the southwest territory with headquarters in Tulsa, Okla.

• **Charles W. Stone**, currently at Washington as an advisor for the OPA division, has been elected secretary of the Interstate Drop Forge Co., Milwaukee. Other officers re-elected were: **C. E. Stone**, president; **H. C. Osborne**, vice-president; **C. C. Bremer**, treasurer, and **W. C. Frye**, **Edgar L. Wood**, **W. H. Brand**, **Brinton Welser** and **H. S. Greene**, directors.

• **Gerald L. Smith**, who has been released from army duties, has returned to the Smith Engineering Works, Milwaukee, as vice-president in charge of sales.



**WILMOT F. WHEELER**, president,  
American Chain & Cable Co., Inc.

• **Wilmot F. Wheeler** has been elected president of American Chain & Cable Co., Inc., Bridgeport, Conn., succeeding the late **William T. Morris**. Mr. Wheeler has been with the company since 1916, was elected a director in 1919 and treasurer in 1920. He has been executive vice-president and treasurer since 1936. **Cyrus N. Johns** has been elected executive vice-president. Mr. Johns joined the Page Steel & Wire Co., now a division of American Chain & Cable Co., Inc., in 1913, and was made general manager of that division in 1933. In 1937 he was elected a director of the company and in 1940 vice-president in charge of operations of all plants. **Stanley Mann** has been elected treasurer. He has been a director of the company since 1936 and assistant treasurer since 1943.

• **Carl E. Nagel** has been appointed manager of editorial service of the Westinghouse Electric Corp., Pittsburgh.

• **William R. Watson** has returned to the Pennsylvania Salt Mfg. Co.'s Special Chemical Div. after serving with the Navy in the Pacific. Two trainees also have joined the division. They are **H. Roper Davis**, who formerly worked for the Fercleve Corp., Oak Ridge, Tenn., and **John W. Beaver**, recently discharged from the Army Air Force and formerly with **B. F. Goodrich Co.**

• **Edwin T. Jackman** has resigned as district sales manager of Firth-Sterling Steel Co., after having served in that capacity for 18 yr.

• **Max Miller** has been appointed sales manager of the Duraloy Co., Scottdale, Pa.

• **Robert A. Parks** has been named general sales manager of the Jessop Steel Co., Washington, Pa. Mr. Parks was formerly district manager for Jessop in Washington.

• **Edwin R. Fellows, II**, has been appointed export manager of the Fellows Gear Shaper Co., Springfield, Vt., and will handle all matters pertaining to export and foreign sales.

• **William V. C. Brandt** has resumed his former position recently as manager of Exide motive power sales for the Electric Storage Battery Co., Philadelphia, after serving in the Navy during the war.

• **Dwight E. Adams** has resigned as Philadelphia district representative of Heppenstall Co., Pittsburgh. He plans to remain in Philadelphia and establish himself as a manufacturers' representative.

• **Albert O. Vogel** has been named assistant to the president of the Vilter Mfg. Co., Milwaukee. Previous to his enlisting in the Navy, he had been in the sales and engineering dept. at Vilter.

• **P. H. Lair** has been appointed manager of the New York sales office of the Dampney Co. of America, Hyde Park, Boston. He will offer consultation and service in the field of protective coatings.

• **Lt. B. W. Ross** has returned to his duties as sales engineer with Consolidated Products Co., Inc. of New York. **Cpl. James F. Flannery** is also returning to his duties with the sales staff of the company.

• **G. C. Derry** has been elected president for the ensuing year of the National Assn. of Fan Manufacturers, Detroit. **R. H. Nelson** has been named vice-president, and **L. O. Monroe**, secretary-treasurer.



CARL H. MORKEN, executive general superintendent, Centrifugal Casting Co., Inc.

• **Carl H. Morken**, formerly general superintendent of the Carondelet Foundry Co., St. Louis, has joined the Centrifugal Casting Co., Inc., Bluffton, Ind. In his new position he is acting as executive general superintendent of all present operation and the new plant which is now under construction.

• **Lt. Col. Guy DeKuiper** has returned to the Magnesium Sales staff of Dow Chemical Co. after service in the Army. He will be stationed in the Washington office. **Lt. Leland Wallace, Jr.** has joined the St. Louis office of the Magnesium Sales staff. **J. D. Garinger** has been transferred from the Bay City division of the company to the Magnesium Sales Div. in Chicago.

• **Joseph W. Zvone** has been appointed chief engineer of U. S. Steel Supply Co., Chicago. Before entering the armed forces, Mr. Zvone was plant engineer for Container Corp., Carthage, Ind.

• **S. J. Mergenhagen** has been appointed district representative in Philadelphia for the Heppenstall Co. Prior to becoming a member of the Heppenstall sales organization in Pittsburgh last August, Mr. Mergenhagen had been for 8 yr the Erie, Pa., district sales manager of Brace-Mueller-Huntley, Inc., sales agents for Heppenstall products.

• **Edward E. Helm**, general sales manager of Reliance Electric & Engineering Co., Cleveland, has been elected sales vice-president of the company.

• **Dan C. Pierce** has been appointed road machinery sales manager for the Heil Co., Milwaukee; **Robert L. Miller**, assistant sales manager of the same department; and **Leonard C. Anderson**, manager of district sales.

• **W. F. Benson** has joined Federal Electric Products Co., Inc., Newark, N. J., as district sales representative in the Michigan area. Mr. Benson comes to Federal with 20 yr of experience in the electrical industry.

• **Louis E. Beaupre**, former chief of the industrial supply section of the WPB, has been appointed assistant general manager of Lectrolite Corp., Defiance, Ohio.

## OBITUARY...

• **Robert R. Jenks**, 57, president of Fales & Jenks Machine Co. and treasurer of the Woonsocket Press Corp. until 1929 when the two companies were sold to the Whitin Machine Works, Whitinsville, Mass., died Feb. 11.

• **John H. Robinson**, executive vice-president, Wheeling Corrugating Co., Wheeling, W. Va., died Feb. 13. He was formerly manager of the St. Louis warehouse but has been located at Wheeling for the past 16 yr. Mr. Robinson would have completed 50 yr with the company in 1947.

• **S. Wells Utley**, president and general manager of Detroit Steel Casting Co., Detroit, died recently at his home. He was a former president of the Michigan Manufacturers Assn. and member of the board of the NAM.

• **Robert L. Gordon**, 71, vice-president and director of Pullman-Standard Car Mfg. Co., died Feb. 12 in St. Petersburg, Fla. He was in charge of the company's sales at their New York office, and also was a vice-president of Pullman-Standard Car Export Corp.

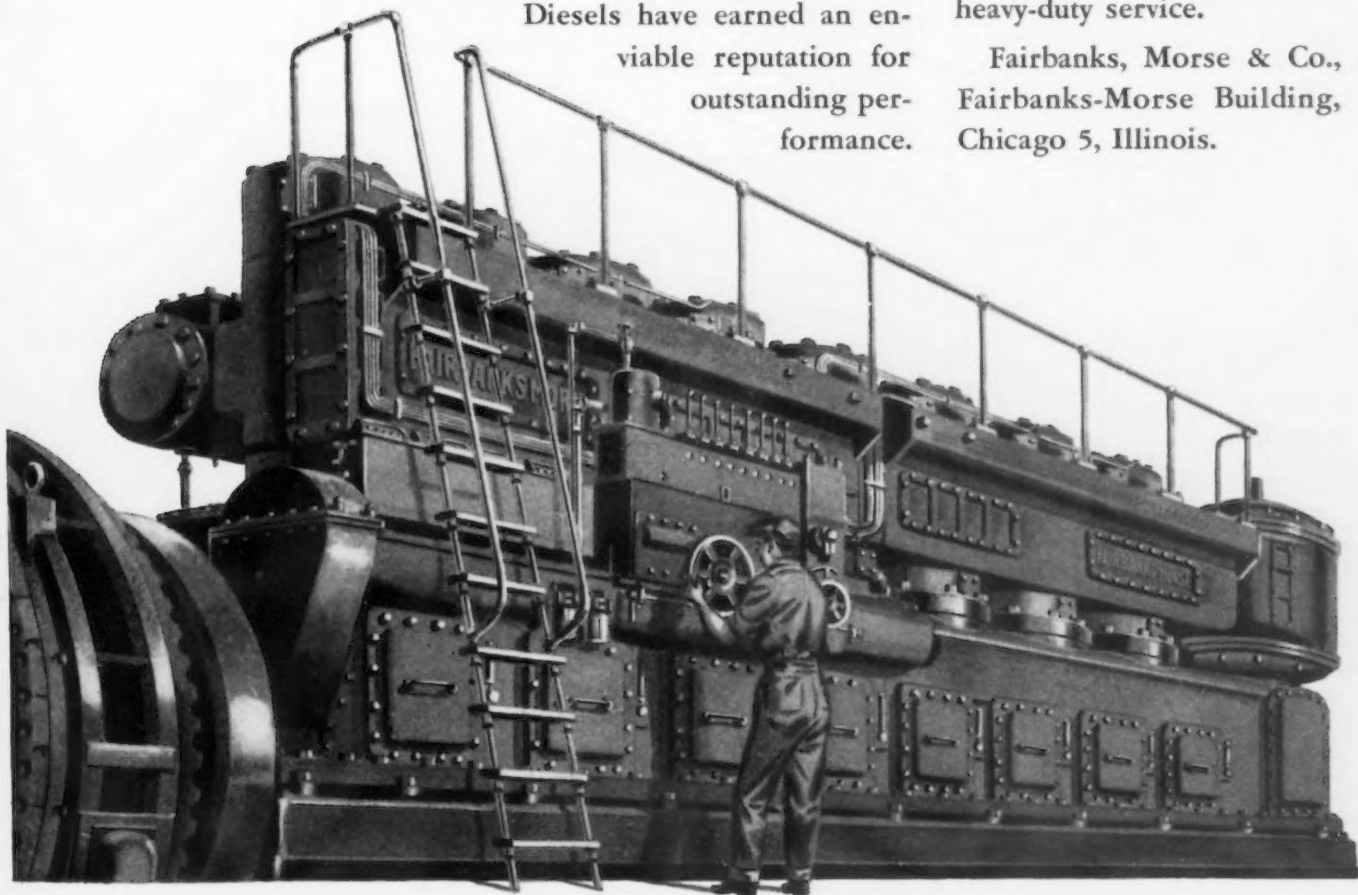


# WORTH REMEMBERING see Fairbanks-Morse **FIRST FOR DIESELS**

One of the first Diesel engine manufacturers in this country, Fairbanks-Morse has pioneered a notable list of Diesel improvements. As a result, Fairbanks-Morse Diesels have earned an enviable reputation for outstanding performance.

Their operating records prove their low operating costs and low maintenance costs... prove, too, that they have the stamina to stand up year after year in sustained, heavy-duty service.

Fairbanks, Morse & Co.,  
Fairbanks-Morse Building,  
Chicago 5, Illinois.



## Fairbanks-Morse

*A name worth remembering*



Diesel Locomotives • Diesel Engines  
Scales • Motors • Pumps • Generators  
Magnetos • Stokers • Railroad Motor  
Cars and Standpipes • Farm Equipment

# Dear Editor:

## CERAMIC DEVELOPMENT

Sir:

The Feb. 7 issue under Newsfront, second paragraph, referred to a new ceramic development which when applied to conventional steels will withstand the high temperatures of airplane exhaust stacks and provide the necessary resistance to corrosion. Will you kindly advise the name of the ceramic material and the manufacturer's address.

A. R. ALLARD  
Vice-President—Manufacturing  
General Steel Castings Corp.  
Eddystone, Pa.

● Full details of the development have been released by the National Bureau of Standards and were published in the Feb. 14 issue, starting on p. 157.—Ed.

## MOTOR PARTS INQUIRY

Sir:

Could you advise me where I could obtain parts for Curtiss OX-5 airplane motors? It is a very old model and I would appreciate any help you can give.

R. V. DORBECK  
Hollywood Blvd.  
Point Pleasant, N. J.

● Suggest you write to Curtiss-Wright Div., Plant No. 2, Municipal Airport, Buffalo, for information, as they built the motors.—Ed.

## CYLINDER FINISH

Sir:

On p. 62 of the Jan. 24 issue of THE IRON AGE in the article "Brazed Sheet-Metal Automobile Engine," I was surprised to note that "A light honing completes the cylinder operations to produce a surface finish of approximately 60 m in. rms." A honing operation usually produces a finish of approximately 2 to 3 m in. rms. A finish of 60 m in. rms is only an average finish such as produced by finish turning, milling or rough grinding. I would not think that such a surface would be suitable for a cylinder bore. Are you sure of your facts?

RALPH A. GOLDRICK  
Wilmington Shops  
Du Pont Corp.  
Wilmington, Del.

● We made a recheck with the Crosley Corp. and have it on the authority of their chief engineer that the finish used on the cylinder bores is 60 m in. This finish is considered adequate, as it has been found that the extremely fine finish employed at one time in aircraft cylinders was unable to retain adequate lubricating oil on their super smooth surfaces, and as a result, piston and ring-wear was very rapid. While 60 m in. may seem somewhat rough, this is substantially reduced during the running in of the engine.—Ed.

## CROSLEY AUTOMOBILE ENGINE

Sir:

Will you please send tear sheets of the article "Brazed Sheet-Metal Automobile Engine" appearing in the Jan. 24 issue.

JOSEPH W. PUGH  
Route 1  
Round Lake, Ill.

● Tear sheets have been mailed.—Ed.

## CENTRIFUGAL CASTING

Sir:

We would appreciate having a list of foundries in Michigan, Ohio, Indiana or Illinois that do centrifugal casting of alloys with high physical properties.

R. M. SANDBERG  
General Manager  
Columbia Tool Steel Co.  
Chicago Heights, Ill.

● List has been forwarded.—Ed.

## STAINLESS WIRE

Sir:

Can you give additional information on the following statement in the Newsfront of Feb. 7? "United States practice in recording on wire is to use a modified 18-8 stainless steel. Investigators are working now on the practicability of a self-lubricating stainless wire." Usually I find additional information on Newsfront items in the body of your magazine, but I have been unable to do so for these items.

AUGUSTUS JONES  
Rensselaer Polytechnic Institute  
Troy, N. Y.

● Additional information unavailable at the moment, but we expect to publish further data in about 2 months.—Ed.

## HIGH SPEED CUTTING

Sir:

Will you kindly send a reprint or set of tear sheets of the article "Super High Speed Cutting of Metals" which appeared in the May 10, 1945 issue.

J. R. KUNTZ  
Foreman, Tool Room  
Inland Mfg. Div.  
General Motors Corp.  
Dayton, Ohio

● Tear sheets have been mailed.—Ed.

## PREFABRICATED HOUSES

Sir:

Item six in the Newsfront of the Jan. 24 issue intimated that mediocre quality materials and construction methods were used in the prefabricated houses shipped from America.

Would you please be kind enough to furnish me with the source of this information and any additional knowledge you might have concerning the brand or brands of homes involved.

C. T. MEYER  
C. Theodore Meyer, III  
Bridgeport, Ohio

● The source of the information on the quality of materials and construction used in American produced British prefabricated houses was the London Daily Mail. Sorry we do not have the information on the producers of these houses.—Ed.

## STATIC MOLDS

Sir:

Please send me the tear sheets on "High-Pressure Feeding of Static Molds" which appeared in the Jan. 10 and 17 issues.

K. G. PRESSER  
Chief Metallurgist  
National Supply Co.,  
Springfield, Ohio

● Tear sheets have been mailed.—Ed.

## IRON POWDERS

Sir:

Will you please give me a list of the manufacturers of electrolytic iron powders.

R. T. MEAD  
Engineering Dept.  
Samson United Corp.,  
Rochester, N. Y.

● A list of several companies has been sent.—Ed.

## BRITISH EN SPECIFICATIONS

Sir:

We should be pleased if you would send us a tear sheet of "British EN Alloy Specifications," as given on pp. 71 to 76 inclusive of the Nov. 15, 1945 issue.

H. HICKS  
Managing Director  
Sheffield Forge & Rolling Mills Co., Ltd.  
Sheffield 3, England

● Tear sheets are on the way.—Ed.

## SOIL PIPE MANUFACTURER

Sir:

We would appreciate it if you would send us a list of such plants that manufacture soil pipe.

I. F. STIEL  
Pan American Affiliates, Inc.  
New York 17

● A list of companies has been forwarded.—Ed.

## TIMKEN ALLOY

Sir:

Kindly send us tear sheets of the article "16-25-6 Alloy for Gas Turbines" by Martin Fleischmann, which appeared in the Jan. 17 and 24 issues.

G. V. CORBETT  
Advertising Manager  
Driver-Harris Co.  
Harrison, N. J.

● Tear sheets have been forwarded.—Ed.



# NEED SOME LARGE SPRINGS NOW?



Coiling equipment forms bars up to 2½" diameter

**L**ARGE SIZE springs can now be supplied at a speed that will "perk up" your production schedules. Extensive manufacturing facilities at Muehlhausen are responsible, where one entire plant is devoted to hot-coiled springs.

Besides quick, quantity delivery, you get two other important advantages from this hot-coil specialization: Design of your springs by Muehlhausen engineers to best meet operating conditions; extra spring life gained by "production lab" control of all processes.

See how these springs are made—SEND FOR NEW ILLUSTRATED FOLDER ON HOT-COILING SPRINGS.

**MUEHLHAUSEN SPRING CORPORATION**  
*Division of Standard Steel Spring Company*  
817 Michigan Avenue, Logansport, Indiana

*To improve product performance, use*

## **MUEHLHAUSEN Designed SPRINGS**

# This Industrial Week . . .

## • Coal Strike Threat Worries Steel

## • Mine Supplies Still at Low Ebb

## • Ingot Output Rises to 61 Pct

**R**ESUMING operations at a much faster rate than had been expected, the steel industry this week was pondering over the threat of a coal strike in April. Negotiations for higher wages in the mines are expected to be underway by March 10 or shortly thereafter.

Even though the steel industry was almost completely shutdown for more than four weeks because of the steel strike, the coal mines owned by steel firms operated at a high level, but these supplies cannot be utilized to carry on steel output if a prolonged coal strike occurs.

Some steel companies made provisions to lay down the coal mined at their pits so as to have it on hand when steel operations were resumed, but by far the larger segment of the steel industry was unable to make such arrangements with the result that these badly needed coal supplies were diverted into commercial channels. The industry's largest operator made no agreements with the steel union to permit the stocking of coal from its mines and apparently also was unable quickly to make provisions for storage. Consequently almost 90 pct of the coal mined from this firm's properties found its way into commercial channels during the period of the steel strike.

John L. Lewis may notify the coal operators in the latter part of this week or next week that new wage demands will be made. It is expected in some circles that the United Mine Workers will attempt to keep its present take-home pay (which in many mines amounts to \$63.50 a week for six 9-hr days) the same for a 40-hr work week. Because of absenteeism and other reasons the actual take-home pay is about \$61 a week.

Mr. Lewis in his opening address to the coal operators may demand an end to both wage and price controls and call for free collective bargaining. There is one thing certain, however, he will as in the past attempt to get a better bargain for his coal miners than Phil Murray obtained for steelworkers. A demand for the same pay in 40 hr as is now being paid for an average 54 hr week would represent about a 25 pct increase. Overtime in the mines is paid for on the basis of all time worked over 35 hr a week.

Many steel companies would be forced to reduce steel output substantially if the coal strike should last for two weeks. While other firms would probably be hit if the coal tieup should last as long as three or four weeks. In any event a strong possibility of a prolonged tieup would force many steel companies to slow down production as a safety measure against damage to coke ovens.

**T**HE OPA on March 1 is expected to announce an entire new list of steel prices which will reflect the allocation among various products of the recent \$5 a ton average boost. Provision will be made to help eradicate the plight of the small nonintegrated maker so that the increase in semifinished steel will not be as great as the adjustment in finished items made by the nonintegrated mills.

Unless plans are greatly changed within the next few days, semifinished steels such as sheet bars, billets, tube rounds, wire rods and skelp may be advanced \$3 a ton. Finished items with a few exceptions are expected to be raised \$5 a ton. In addition to the latter increase some products such as sheets, strip, nails, tubes and bars may be given a further boost in order to afford relief to the nonintegrated makers who produce these products from semifinished steel purchased from the large companies.

Going ahead by leaps and bounds, the steel ingot rate made extensive gains this week and reached 61 pct of rated capacity, up 36 points from last week's revised rate of 25 pct. If the present rate of recovery continues, output next week may be above 70 pct of capacity, a figure which would be far greater than steel officials believed could be obtained in so short a time.

**I**NCOMING business at steel companies remains at low ebb. The slump apparent since about two weeks before the strike is due to the inability of steel customers to schedule their requirements somewhat into the future and also to the fact that with quota protection advance ordering for the remainder of this week would produce little gain.

Nearly all major mills have specified either two or three months in which quotas will be either eliminated or become inoperative and production will be devoted to cleaning up orders which have been carried over. One major mill has set aside April and May to catch up on undelivered and previously scheduled tonnage. Orders slated for those months are being postponed for June or July rolling.

Another major mill which had set aside April for catching up prior to the strike has specified July for handling carryovers which have accumulated during the strike. Still another mill will not handle flat-rolled quota tonnage for May and June and is considering a similar catch-up period for its other products. The entire third quarter will find no quotas for customers of another big steel firm which is now booked through the remainder of the year on all products. However, deliveries on previously scheduled tonnage will continue.



# • **CHANGES PLANS FOR GENEVA STACKS—**

CPA has been forced to abandon its plans to blow in two blast furnaces at the Geneva Steel plant. While plans were being made to operate these furnaces, the Geneva Steel Co. informed CPA that it did not have molds to cast the pig iron. CPA had estimated that these two furnaces had an annual capacity of 564,000 tons of pig iron. Taken from the estimated 1 million tons that CPA expected to get from five furnaces, this will leave only 436,000 tons. CPA will go ahead with the plans to produce from the other three furnaces that are on its list to be blown in for the purpose of producing iron for converting into housing supplies and other critical requirements.

• **QUALITY CONTROL TALK—**Development of statistical methods of controlling quality, reducing inspection costs and minimizing rejections will be discussed by M. H. Eisenhart, president of Bausch & Lomb Optical Co., Rochester, N. Y., at a Reconversion Problems School luncheon of the Chicago Assn. of Commerce, Mar. 5, in the LaSalle Hotel. The application of quality control methods to distribution trades and other phases of business operation, will also be covered in Mr. Eisenhart's talk. The meeting is a part of the two-day Midwest Quality Control Conference sponsored by the Chicago Society for Quality Control and the quality control groups of Northwestern, Illinois, Indiana and Iowa Universities.

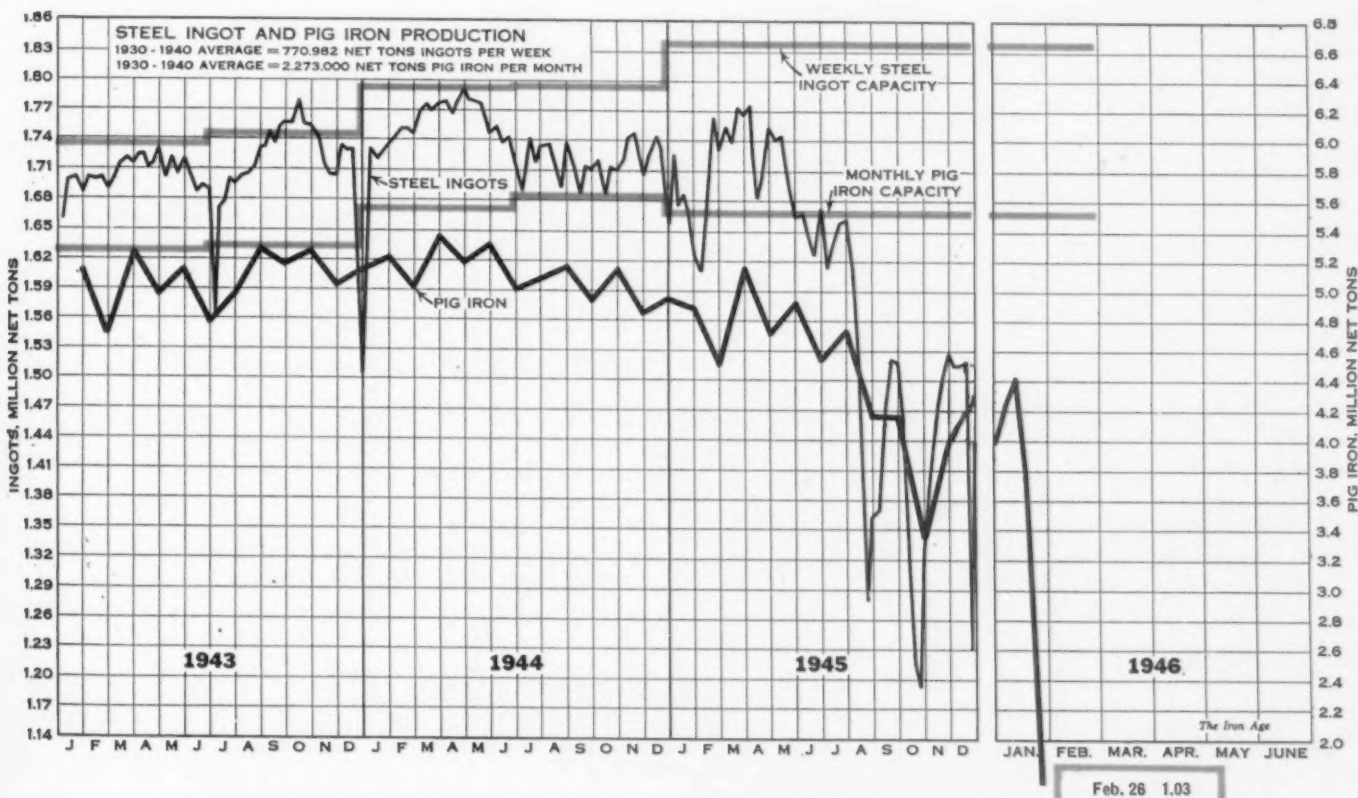
• **COKE OVEN DAMAGE?—**Possible damage to four coke oven batteries at the Joliet, Ill., coke plant of Carnegie-Illinois Steel Corp., can be ascertained in from three to five weeks, during which the ovens will be gradually brought up to heat, according to the company. Early in the strike 20 of 44 foremen who had stayed in the plant to keep the ovens under heat, walked off the job, and 22 other supervisory employees brought in as replacements left at company direction when support of state police was with-

drawn. The 24 remaining foremen were insufficient to keep the ovens under heat. The company also feared that the ovens could not be cooled sufficiently slowly, and at the time estimated \$20 million damage would result. Prior to the strike, a proposal that sufficient maintenance men be allowed through picket lines to keep the ovens under heat failed when the company refused to meet union terms that only union members be allowed into the plant.

• **ELECTRICAL RANGE OUTPUT—**Volume production of electrical commercial ranges is expected by late fall if production stoppages do not interfere, it is reported by a Chicago major producer. Deliveries should be made on all back orders by autumn, it was stated.

• **PLANT FOR SALE—**A government-owned machine assembly plant at 6499 W. 65th St., Chicago, operated during the war by Clearing Machine Corp., has been offered for sale or lease by War Assets Corp. Reported to be suitable for use in assembling heavy machinery, three adjoining buildings provide a total floor area of approximately 41,200 sq ft with a site of about one acre. Milling, drilling and grinding machines, and a number of cranes are on the premises, according to WAC.

• **STEEL SUBSTITUTES—**In endorsing the Truman-Wyatt Housing Program, Henry J. Kaiser has stated that in constructing the 10,000 homes which the Kaiser Community Homes Corp. is pledged to build in 1946, it will be necessary to use substitute materials such as aluminum, fiber-glas, plastics and mineral compositions to replace steel and other scarce materials. Stressing the shortage of steel sheets, Mr. Kaiser said that his companies expect to use aluminum for automobiles, airplanes and home appliances. In many instances, he stated that use of aluminum was more economical than the use of steel.



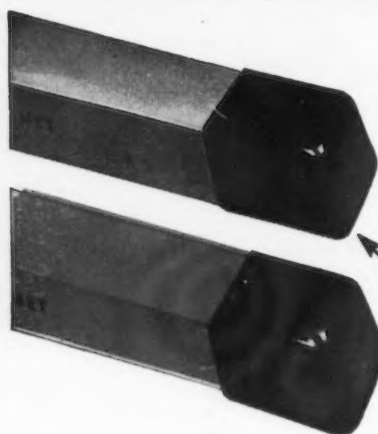
**Steel Ingot Production by Districts and Per Cent of Capacity**

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
February 19....	19.0	22.0	25.0	11.0	21.0	15.0*	85.0	12.0	30.0*	14.0	42.0	23.0	9.0	25.0
February 26....	73.0	63.0	64.0	11.0	77.0	41.0	87.0	56.0	83.0	32.0	50.0	23.0	43.0	61.0

\* Revised

# CARMET

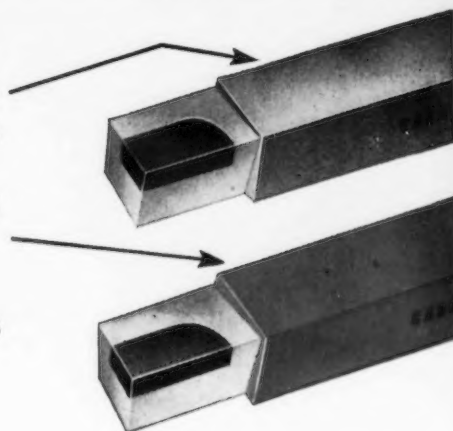
## Carbide Tools and Tips



★ Blue Shanks for Iron and Non-Ferrous Metals

★ Red Shanks for Steel Cutting.

★ Wax Caps Protect Tips in Stock and Transit



### EFFICIENTLY BOXED

Carmet sintered carbide tool bits are packed for shipment in strong, metal-reinforced boxes of distinctive design. The grade, size and number of pieces are marked on each end of the box, for convenience on your stock shelves.



### EASY TO IDENTIFY

In addition to the box marking, and to the shank coloration (see above), each Carmet tool bit is stamped with the name and grade number . . . your stock clerks and machine operators can't mistake them.



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Data on  
CARMET*

*Send for your copy*

The 16-page Carmet Catalog contains full data on types, grades, sizes and applications of standard blanks and tools; information on special sizes, tool shank steel, etc. Write for it today.

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### TOPS IN CUTTING PERFORMANCE

Carmet carbide tips are produced by advanced techniques, under conditions of rigid control that maintain complete uniformity to type and grade. These carbide tools can show you tremendous increases in cutting speeds, and corresponding improvements in your finishing costs. • Let our Service Engineers work with you to fit Carmet tools into your operations.

# ALLEGHENY LUDLUM

STEEL CORPORATION • General Offices, Brackenridge, Pa.

*Pioneer in Specialloys*





**STILL CHIPPER:** Happy about the end of the steel strike, Benjamin F. Fairless, president U. S. Steel Corp., may be thinking of one or two things—where to go for a good rest or what the coal miners may ask for in the way of a wage increase on Apr. 1. He personally emerged from the steel fracas well liked by all sides.

#### New York

• • • Although the steel industry was almost completely shutdown for slightly more than four weeks and coal mining at its captive mines continued at top levels, coal supplies for the industry as a whole could not stand a prolonged coal strike in April.

Some steel companies unable to make arrangements with the CIO steel union were forced to sell their coal into commercial channels. Other steel companies, however, were more fortunate in renting space or making plans to lay down the coal mined during the steel shutdown.

Despite its far-flung coal mining activities, it is understood that the U. S. Steel Corp., especially in its western Pennsylvania plants, has no more than a 10-day supply of coal since it was unable to lay down the coal on company property or failed to make special provision for storage elsewhere. It is also understood that U. S. Steel Corp. was forced to divert into commercial channels close to 90 pct

of the coal mined on its properties during the recent steel strike.

While theoretically the steel industry should have amassed a substantial amount of coal while steel works were shut down the fact that pickets covered most of the entrances to the steel plants made this impossible. For that reason it is expected that should a coal strike develop, which many in the trade expect, steel output will be affected at many plants within a period of ten days to two weeks.

Some steel companies, however, having been able to add to their coal stocks during the steel strike will be in a position to continue steel production at a high level provided the coal strike, if it occurs, does not last more than a few weeks. These companies, it is understood, made provisions to lay down the coal that was being mined in the captive pits while the steel strike was in progress.

There are two schools of thought on the question of John L. Lewis tying up the coal mines before Apr. 1. One group expects that the coal operators will be notified by Mar. 1 what new demands will be made, which means that according to contracts, negotiations shall begin 10 days later. Another group believes that Mr. Lewis will not call the operators into session until he has met with his policy committee.

The consensus is that Mr. Lewis will notify the operators around Mar. 1 that new demands will be made. At the present time the take-home pay in the majority of coal mines approximates \$63.50 a week for six 9-hr days. Because of absenteeism and other reasons the actual take-home pay may be close to \$61.00 a week. Some sources believe on good authority that the United Mine Workers will demand the same pay which they now re-

ceive for 54-hr work for a 40-hr week.

Since the normal work week in a coal mine is 34 hr and since the demand for coal continues exceptional the 40-hr week would represent time and a half for the extra five hours. Such a demand would represent about a 25 pct increase in coal miners' wages.

With John L. Lewis continuing to be unpredictable, nevertheless there is a good chance that in his opening address for higher wages, he will demand an end to both wage and price control and call for free and unfettered collective bargaining. Furthermore, the schism between him and Philip Murray, CIO head, is so strong that he will not want to come out of the coal negotiations with anything equal to what Philip Murray obtained for his steelworkers.

Once again the steel industry is faced with a definite slowdown in output just at the time it would have been able to get over the bad effects of the steel strike. This time, however, the drop in output will not be uniform and many steel companies may be able to ride through a possible coal strike with little or no effect on their output.

Since many steel companies were unable to amass stocks of coal during the steel tieup it is clear that a coal strike will be felt more strongly because of the shutdown of the mines last October. At that time stocks were not heavy and consumption was high. As a general rule steel companies in the fall of the year attempt to increase coal inventories to take care of unseasonable weather.

The bad weather came this winter with the result that coal stocks reached close to an all-time low. Any attempt to speed production from now until a possible coal strike is called will not give steel companies an edge on supplies.

By TOM CAMPBELL

## Steel Prices to Be Announced

### March 1 With Almost Entirely New List

#### New York

• • • The OPA is expected to announce steel price increases on almost all carbon and alloy steel products March 1. One thing is certain—provision will be made in the new price list to take care of most of the problems confronting small nonintegrated steel mills.

The steel industry had asked the OPA to make a single price announcement instead of announcing first nine-tenths of the allocation of March 1 and the remaining one-tenth five weeks from Feb. 15. It is almost a certainty that the OPA will bring out one price list this week which will take care of the full \$5 a ton average price increase.

The steel industry has submitted what it believes to be a simple and fair adjustment in steel prices. It is expected that semi-finished steels will be upped \$3 a ton and most of the other steel items, with the exception of some specialties, \$5 a ton. Semi-finished steel advances will be on such products as wire rods, sheet bars, blooms, billets and slabs, tube rounds and skelp—those items which are used by nonintegrated makers to make such finished products as wire and wire nails, sheets and strip, bars and tubular products.

In addition to the \$5 a ton increase on finished steel products, a further advance of probably less than \$1 a ton will be added to those steel items produced by the nonintegrated maker. This will be done by applying the difference between the \$3 advance on a semi-finished steel and the average \$5 a ton which was permitted. Some last minute snag could change this price setup, but the chances of such a circumstance are considered to be remote.

When the new prices come out they will probably represent the longest step yet taken to iron out the inequalities of the nonintegrated steel price problem. The smaller producers will not only find a smaller increase in their semi-finished supplies, but will find the differential between semi-

finished and finished products enlarged by reason of allocation of the average \$5 a ton price boost. Had the price increase been "across the board" the small makers would have had to pay the same increase for semi-finished steel as they obtained for their products, which would have accentuated an already painful position.

### Canada Affected By U.S. Steel Strike; Price Boost Seen

#### Ottawa

• • • While no definite action has been announced in Canada regarding increased prices for steel, C. D. Howe, Minister of Reconstruction, stated that higher prices for steel are in prospect in the event of wage rates going up. He stated "you cannot raise wages 15 or 20 pct and not increase steel prices." Wage increases still are under negotiation between union officials and representatives of the Steel Co. of Canada Ltd., Algoma Steel Corp. Ltd., and Dominion Steel & Coal Co. Ltd.

Canada continues to face a serious steel shortage as a result of the steel strike in the United States which brought imports to a standstill with no definite date as to when they will be resumed. Officials here have been trying to determine the inventory position of Canadian firms in respect of steel, but have met with little success. It is admitted, however, that shortages already have curtailed operations in some plants, and many more stoppages are expected before the flow of steel from across the line is resumed on a normal basis. Steel inventories among Canadian industries were at a very low ebb for most companies even before the strike shut out imports. Some relief is being afforded by special measures taken to balance out Canadian productive capacity and to curb exports.

Steel production in Canada now is running about 10,000 tons a month above the January figure as a result of increased output of steel

ingots by Algoma Steel Co., which company also has stepped-up output of pig iron by a like amount. It is understood that the greater part of the enlarged output of steel will go to the Steel Co. of Canada plants at Hamilton and Montreal for further processing. Canada's rolling capacity continues well below its capacity for producing raw steel. Steel Co. of Canada Ltd., has been operating at virtual capacity almost since the beginning of the war and as a consequence some of its equipment is in urgent need of repairs. The Steel Co. is Canada's largest producer of diversified finished steel materials.

Shortage of steel was further aggravated by the strike in the United States which suspended shipments to Canada and has had serious effect on the production of consumer goods in this country. Whereas it was expected that retailers would be well supplied with various classes of consumer goods by next July, the date for ample supplies of these materials now has been extended to September and may even be longer delayed if labor troubles result in a serious stoppage of steel production in Canada.

### Weirton to Get Coke Ovens

#### Pittsburgh

• • • Construction will be started soon on two new batteries of coke ovens for Weirton Steel Co., Weirton, W. Va., by the Koppers Co., Inc., Engineering and Construction Division. It is expected that the ovens will be ready for operation in about 12 months.

The project includes the construction of a total of 106 new Koppers-Becker underjet ovens consisting of two batteries of 53 ovens each. The ovens will have a total coking capacity of 2600 tons a day and will be underfired with blast furnace gas.

To provide for additional capacity, Koppers also will make changes and additions to the present byproduct, benzol and coal and coke handling plants at Weirton Steel. The new ovens are in addition to four batteries totaling 156 Koppers-Becker ovens previously built at Weirton by Koppers. The amount of the contract was not announced.





## New Project to Give Texas New Steel Consuming Industry

### Longview, Tex.

• • • Establishment of a new educational-manufacturing project here by R. G. LeTourneau, Inc., gives east Texas a new steel consuming industry, and breathes new hope for completion of the Lone Star Steel Co. plant, 30 miles distant.

LeTourneau has acquired the Army's \$7 million Harmon General Hospital, which once accommodated 2600 patients, which will be transformed into the LeTourneau Technical Institute of Texas, a vocational school.

Students will be given an opportunity to secure industrial experience by studying a new 300,000 sq ft industrial plant while under construction. Its initial products will be Tournalaid concrete house forms and Tournalozers.

Concrete house building machinery is an outgrowth of development work carried on at LeTourneau's Vicksburg, Miss., plant in which a vehicle similar in appearance to an oversized Carryall scraper sets down a concrete shell of a four room house. Three steel forms for inside and outside walls are carried by the Tournalayer—one outside form and two independent interior sections so spaced that a partition wall can be poured between them. After the two inside forms have been covered with reinforcing mesh, the Tournalayer straddles them and lowers over them the outside form which is the body or bowl of the Tournalayer. The concrete is poured. After it has had time to set, the operator collapses the inside form walls away from the house by pressing an electric control button. By pressing another button the outside form with the house is lifted up. Lowering its load to

traveling level, the Tournalayer moves to the house site where it brings the form down to the ground, releases it, and lifts the form off. The house is left standing on a broad foundation which is a part of its walls. A variety of floor plans and door and window locations may be secured by pegging the metal frames into holes variously located over the walls of the form.

Dimensions of the bowl of the Tournalayer are 24 x 30 x 9½ ft, and its overall outside dimensions, 34¼ x 37 ft.

Not intended for highway travel at present, the machine can be uphauled for transportation to a housing area where it could be set up for operation. Transit-mixed concrete could be carried to it there for pouring.

Unique construction fixtures of the factory, for which ground has been broken, include hinged aluminum side walls which may be swung up to open by electric motor drive.

Local civic interests view the plant as a market for steel which may prove the turning point in efforts to secure construction of steel making facilities at the government owned Lone Star Steel Co. plant. The Lone Star plant, at nearby Daingerfield, consists of ore mining and beneficiation facilities, coke ovens, and a blast furnace which has never been blown in. Built as part of the wartime steel expansion program, it was contemplated that steel making and finishing facilities would be added, but a shift in the government program left these facilities unbuilt. The Marshall, Tex., News Messenger quotes Curtis Morris, secretary of the Texas Chamber of Commerce, as stating that LeTourneau will consume 50,000 tons of steel a year at Longview, with possible expansion to 100,000 tons a year. The steel company is understood to be negotiating for a Reconstruction Finance Corp. loan to \$3 to \$4 million to add to its facilities.

LONE STAR ACTIVITY: Tournalayer lays a concrete house. Students will study the intricacies of this new type industry.



## Stabilization Office Modifies New Wage Price Order

### Washington

• • • Several modifications of the new wage-price order, including a provision designed to facilitate quick settlement of wage disputes in plants which had been involved in the steel strike, were announced by the Office of Stabilization Administration on Feb. 21.

The first of these modifications provides for postponement of the effective date of the requirement that prior approval must be obtained for wage and salary increases which are to be used as a basis for price relief until March 15.

The postponement was made to give industry time to adjust to the new policy and to avoid delay in settlement of wage negotiations that have been proceeding under the old policy.

Postponement of the prior approval requirement does not dispense with the necessity of securing approval of a wage or salary increase before it can be used as a basis for price relief. The effect of the action is simply to provide that, between Feb. 14 and Mar. 15, employers may put voluntary wage or salary increase into effect without waiving the right to apply later for approval. Approval, however, must be sought within 30 days of the time when the increase was first reflected in current payrolls. Only if and to the extent that approval is ultimately obtained can the increase be used as a basis for price relief.

The remaining four modifications give pre-approval, or provide for giving pre-approval, to certain classes of wage or salary increases. Wage or salary increases falling within any of these classes may be put into effect and used as a basis for price relief without any application to, or further approval by, a wage or salary stabilization agency.

Pre-approval is given to wage or salary increase made by employers of not more than eight employees. The figure of eight employees was used as dividing line in determining the applicability of many pre-VJ-Day wage controls. This figure has been adopted as an appropriate interim

measure of an exception for small establishments, pending further study to determine whether a somewhat larger figure can be used without inflationary consequences.

The exemption provided for under this temporary action does not apply to firms in which wages are established by a master contract or by similar or identical contracts on an industry or area-wide basis.

Pre-approval is also given to the following types of fringe increases: night shift differentials of not more than 5¢ for the second shift and 10¢ for the third shift; agreements for vacations with pay up to one week after one year's employment, or two weeks after five years' employment; and agreements for paid holidays not exceeding six.

The fourth of the modifications makes provision for the so-called pattern orders, applicable to particular industries or local labor market areas, to be issued by the National Wage Stabilization Board.

To expedite the administration of the new executive order it is planned to make the fullest use of pattern orders of this type. As rapidly as the stabilization agencies are able to determine that a general pattern of wage adjustments has been established for a specified industry, or definable industry segment, or for a local labor market area, they will issue general orders giving pre-approval to wage increase falling within the stated pattern.

Once such a pattern order has been issued, it will no longer be necessary for employers in the industry or local labor market area involved to make individual application for approval of wage increases not in excess of the pattern. Any application for approval of an increase not within the limits of a pattern order must be submitted for specific approval.

The fifth modification is designed as a shortcut, in lieu of a general pattern order, to facilitate the quick settlement of wage controversies in plants which have been involved in the steel strike.

Under the modification, pre-

approval is given to adjustments not in excess of 18½¢ above VJ-Day rates in:

(1) Any plant engaged in the basic steel industry.

(2) Any plant engaged in the iron ore mining industry.

(3) Any plant engaged in the steel processing or fabricating industry where such increase was put into effect in settlement of a strike existing on Feb. 14, 1946.

(4) Any plant engaged in the steel processing or fabricating industry operated by a company which also operates a plant of a class described in (1), (2) or (3), provided the company involved has historically followed the same pattern of wage adjustment in both plants.

The modification does not apply in the case of steel processing or fabricating plants in which there was no stoppage of production at the time of the executive order, with the exception stated in paragraph (4) above. Such plants must apply for approval of any adjustment granted, before using it as a basis for seeking price relief, although, as a result of the postponement referred to above, the adjustment can be made effective prior to receipt of approval, if settlement is reached before March 15.

The order specifically provides that, in passing on such applications, the National Wage Stabilization Board is not bound to treat a pre-approved adjustment as establishing a controlling pattern for the particular industry segment or locality involved.

### Strike Hits Stalemate

#### Chicago

• • • Settlement of the five-week old International Harvester Co. strike missed fire recently when the company announced it would approve the 18¢ an hr increase recommended by the government fact-finding panel only if the higher wages were accepted by the War Stabilization Board as a basis for price increases. The union had stipulated that it opposed any increase in prices as a basis for settlement.



## OPA Sets Regulation for Price Rises

### Washington

• • • Outlining the price phases of the new wage-price policy, OPA on Feb. 21 announced methods by which it will work with industries and firms to provide speedy action in price adjustments resulting from wage increases. Because it has set the pattern, the first industry undergoing price readjustment is still, the outgrowth of the 18½¢ an hr wage increase granted the CIO-USW.

OPA pointed out that the Executive Order of Feb. 14 introduced only one basic change with respect to consideration of wage increases as grounds for application of price increases. This change requires OPA to take into account immediately the effect on cost and earnings of certain broad categories of wage increases which previously were not to be considered until after a test period of six months. Only three relatively narrow kinds of wage increases heretofore were approvable for purposes of consideration in ceiling price adjustments. Now the types of wage increases approvable for immediate consideration in ceiling price cases, it was stated, have been greatly enlarged by adding those which the National Wage Stabilization Board has approved as being consistent with the general pattern of wage and salary adjustments which have been established in the industry or local market area between Aug. 18, 1945 and Feb. 14, 1946, the effective date of the new order.

In weighing the extent of price adjustments needed as the result of approved wage increases, OPA is directed to provide an adjustment if necessary to enable an industry not operating at temporary low volume to earn an average rate of profit during the next 12 months that will be approximately equal to the rate of return on net worth before income taxes which was earned by the industry in a normal peacetime base period.

OPA explained that to meet this requirement it will, of course, have to consider the prospect of improvement in the earnings of an industry during the 12 months as a result of growing volume, cost reductions, change in realiza-

tion and other factors. Where the projection of an industry's prospects for earnings improvement might lead OPA to conclude that existing ceiling prices, though now below current total costs, would nevertheless yield peacetime profits for the ensuing year, OPA said that it is required by the Executive Order to raise such ceilings to the point where they prevent loss operation at the time of the adjustment. It was pointed out that there is an exception to this rule in the case of industries operating at a temporary low volume where increases sufficient to eliminate loss would be likely to push prices "to absurdly high levels."

It was emphasized by OPA that the new policy does not require that the full amount of an approved wage increase, or any part of it, must necessarily or automatically be reflected in ceiling price increases. The extent of the price increase for any particular industry, it was pointed out, depends not only on the wage increase but also on all the other factors that will affect the industry's earnings in the next 12 months. It was added that, though in all of these industries wage costs amount to one third of their prices, nevertheless the ceiling prices of their products will not be advanced 5 pct automatically. To illustrate this point, OPA assumed an approved wage increase of 15 pct in three industries and showed that in Industry A ceiling

prices might not be increased at all; in Industry B they might be advanced 2 or 3 pct and in Industry C they might be increased the full 5 pct, each case depending on the earning position of the affected industries.

To assist industries which are making wage increases, OPA set forth important points which it said should be kept in mind in applying for price adjustments and announced that it is streamlining procedures for handling problems rising under the new policy:

(1) Before any industry or firm can use wage increases as a basis for seeking price action, the wage increase must be approved for the purpose of the National Wage Stabilization Board. Criteria and procedures for wage approval are to be determined and announced by the Director of Economic Stabilization and the Stabilization Board. As stated in the President's Executive Order, all lawful wage increases granted before the effective date of the Feb. 14 order are approved and may be taken into account as a basis for increasing price ceilings. Rules waiving prior approval of wage increases in certain other cases and providing for pre-approval in still other situations were issued on Feb. 21 by Judge John C. Collet, Stabilization Administrator.

(2) OPA said that it cannot make any advance commitments about price increases contingent upon prospective grant of a particular wage increase.

(3) OPA will give primary em-

**THROUGH HER PACES:** Developed from the Messenger, which was used during the war years, the Miles Germini is a twin-engined monoplane capable of seating four people and their luggage and which has a maximum speed of 150 mph.



phasis to the review of ceiling prices for an industry as a whole on an over-all basis. Only where industry-wide consideration does not seem appropriate will individual company cases be given priority. Industry-wide determination can be quickly followed by supplementary individual company adjustments, where necessary, OPA said.

(4) OPA will, as a general rule, work through established industry advisory committees and will rely on their help in obtaining speedily the necessary information for the re-examination of ceiling prices. The pricing agency said that it is prepared to appoint immediately new committees in any industries where industry advisory committees do not as yet exist. If OPA officials foresee a pricing problem developing as a result of wage developments, they said they would not wait to hear from an industry but will call in industry advisory committees promptly, as it has done in a series of 23 meetings scheduled from Feb. 20 to March 4 in the steel and fabricating industries.

(5) In instances where only some of the firms within an industry have granted wage increases or where some firms have granted increases and others have unsettled wage negotiations, OPA will consult with industry advisory committees as to the most appropriate time to appraise the need for price relief.

## Electro Refractories Report Sales Decline

Buffalo

• • • Electro Refractories & Alloys Corp. reported net income for 1945 of \$127,088, equal to \$1.50 a share, compared with \$166,433 or \$1.96 a share in 1944.

President Grant S. Diamond said sales for the current year are expected to total \$1,800,000 compared with \$3,145,614 in 1945, "after careful consideration of the problems of reconversion facing our customers and the delays arising out of the unsettled labor situation."

The company was "fortunate enough to be able to work out a satisfactory wage adjustment to avoid any interruption of production at our plant during the national steel strike," Mr. Diamond said.

## Planer Co. Changes Hands

Cincinnati

• • • The Cincinnati Planer Co., Forrer St., Oakley, has changed hands recently when the firm was bought for \$3,500,000 by a local group headed by Sidney G. Rose, Philip L. and Ben Moskowitz.

The company will continue under the management of George Langen, former vice-president, who now becomes president, with Mr. Rose taking the office of chair-

man of the board. Other officers will be Philip Moskowitz, vice-president; Verner Schoolfield, vice-president and treasurer; John H. Daum, vice-president in charge of Sales; and Ray J. Steiner, secretary.

## Two-Man Picket Crew Halts Annealing Lines

Pittsburgh

• • • Before the ink was dry on the Jones & Laughlin Steel Corp.-CIO United Steel Workers of America contract, a wildcat strike at the company's strip and sheet mill shut down the annealing furnace dept. The strike started when the day shift, comprised of 11 men, refused to work, demanding that an additional man be added on each of the three 8-hr shifts.

A company representative stated that a temperature recorder was demanded despite the management's contention that with only 13 of the 42 furnaces in operation, none was needed. The day shift held fast to their demands and walked off the job. The strike continued into the afternoon shift when a two-man picket line at the gate prevented the nine men on the second shift from entering the plant.

## Timken to Transfer Operations to Canton

Canton, Ohio

• • • Operations at the Timken Roller Bearing Co.'s Newton Falls, Ohio, plant will be transferred to Canton and the plant abandoned when the steel dispute at the company ends, according to William E. Umstadt, Timken president.

At peak operations the Newton Falls plant employed 400 workers in processing steel tubes and bearing cups. Mr. Umstadt estimated that transfer of operations to departments of the Timken main plants will require about 60 days.

The Newton Falls plant opened during the war because Timken was unable to get enough manpower to meet its wartime production requirements in the Canton area. The plant occupied part of the old Newton Steel Co. plant which is now owned by Republic Steel Corp. Republic's Ideal Foundry Div. occupies another part of the building.

## COMING EVENTS

Feb. 25-Mar. 1—Spring Meeting, American Society for Testing Materials, Hotel William Penn, Pittsburgh.

Mar. 4—SAE German Engineering Evaluation Meeting, Rackham Educational Memorial, Detroit.

Mar. 5-6—Midwest Quality Control Conference, La Salle Hotel, Chicago.

Mar. 20-22—Production Show and Conference, Chicago Technical Societies Council, Stevens Hotel, Chicago.

Mar. 29-30—American Gas Assn. Conference on Industrial and Commercial Gas, Commodore Perry Hotel, Toledo.

Apr. 2-5—Packaging Exposition, sponsored by American Management Assn., Public Auditorium, Atlantic City, N. J.

Apr. 3-5—SAE National Aeronautical Meeting, Hotel New Yorker, New York.

Apr. 8-12—ASTE Fifth Exposition, Cleveland Public Auditorium, Cleveland.

Apr. 10-13—Birmingham Congress, Electrochemical Society, Inc., Hotel Tutwiler, Birmingham.

Apr. 11-13—Spring Congress, Electrochemical Society, Inc., Birmingham, Ala.

Apr. 22-27—National Plastics Exposition, Grand Central Palace, New York.

Apr. 25-26—Twenty-ninth AIME Annual Open-Hearth Steel and Blast Furnace and Raw Materials Conferences, Chicago.

May 6-7—Annual Spring Conference, Assn. Iron & Steel Engineers, Congress Hotel, Chicago.

May 6-10—Golden Jubilee Foundry Show, American Foundrymen's Assn., Cleveland Public Auditorium, Cleveland.

May 29-31—Machinery Dealers National Assn., national convention, Claridge Hotel, Atlantic City.

June 2-7—SAE Summer (semi-annual) Meeting, French Lick, Ind.

June 3-5—American Gear Manufacturers Assn., Annual Meeting, The Homestead, Hot Springs, Va.

June 17-18—First Annual Meeting, American By-Product Coke Institute, Seaview Country Club, Absecon, N. J.

June 24-28—Forty-ninth Annual Meeting, American Society for Testing Materials, Hotel Statler, Buffalo.



# Weekly Gallup Polls . . .

## Public Favors Congressional Action on Strikes

• • • A large majority of the American people think the time has come for Congress to take action on the strike situation, according to George Gallup, director, American Institute of Public Opinion.

The country is not anti-union and never has been in recent years. But it shows signs of increasing impatience with labor-management disputes that lead to work stoppages which tie up essential public services or paralyze whole cities.

The average American, polls have found, resented strikes in wartime; evidence today shows that he resents them almost as much in peacetime reconversion. And the mood of the country, as judged by comments made to the 220 interviewers for the institute who conducted the survey throughout the nation, is not for a hands-off policy on the part of the government in the present crisis.

The general attitude of the people is shown in the following survey:

"Do you think that Congress should or should not do anything about the strike situation?"

The vote:	Pct
Should . . . . .	74
Should not . . . . .	14
No opinion . . . . .	12

Those who favor some kind of action were asked, "what should Congress do?"

Their replies show that while some are for action favorable to unions, such as a general wage rise, nevertheless the dominant weight of opinion is on the side of action to control or regulate organized labor. This sentiment found reflection in one branch of Congress last week when the House passed the Case Bill to regulate labor-management disputes.

The 74 pct who favor action of some kind divide into groups in the following ratio:

- 48 pct favor action involving some sort of discipline of labor unions.
- 5 pct favor a general policy of granting union demands for higher wages.
- 9 pct think the government should define its labor policy and then enforce it.
- 12 pct offer miscellaneous suggestions or have no opinion.

74 pct

The people who want disciplinary

action have varied ideas as to how far that discipline should go.

A substantial number would take away labor's strike weapon entirely by making all strikes illegal.

Another important group wants less drastic action—legislation, for example, to set up fact-finding boards or cooling-off periods such as President Truman has recommended.

Others would do little about strikes in themselves but would pass laws to regulate general union practices and control union leaders, or would give employers the right to sue unions in court for breach of contract. Still others favor compulsory arbitration of labor disputes—a step which union leaders have long opposed.

Rightly or wrongly, the public seems to place more blame on organized labor than on management for the present strike situation. The number in the poll advocating action to curb management was small—evidence which suggests that unions face a more serious public relations problem than management in the reconversion period.

As to which political party do the voters of the country think is better able to handle such important problems as reducing strikes, encouraging new business, keeping wages and the farmers' income up, maintaining high profits for business, keeping taxes from getting too high, more than 200 field reporters for the institute have been probing voters and voter thinking on these issues during recent days. Questioned on which party is better able to handle eight different problems, voters give the Republicans the advantage on three, the Democrats the advantage on three, and neither party the advantage on the remaining two.

The weight of voter opinion is with the Republican Party on such problems as keeping taxes from getting too high, keeping business profits up, and encouraging new business.

The Democratic Party is given the edge on the handling of such problems as keeping workers' wages high, maintaining a high income

## Public Favors Program For Disciplinary Action Against Recalcitrant Labor Unions

for farmers, and the problems of world affairs.

It is a toss-up in the voters' minds as to which party would be better able to handle the job of reducing strikes and labor trouble and the job of running the government efficiently.

Since October, when a similar survey was made, the Republicans have made progress in convincing voters of their ability to handle the latter two problems. In the October survey, the Democrats held the advantage as the party better able to handle these problems.

The same thing holds true for the problem of keeping taxes from getting too high. While today, the weight of opinion favors the G.O.P., in October it favored the Democratic Party.

Voters in the survey were asked:

"As you feel today, which political party—the Democratic or Republican—can handle each of these problems better?"

The problems and the votes:

	Those in Which Democratic Party Has Advantage		
	Dem. Pct	Rep. Pct	No dif. Pct
Dealing with world affairs . . .	49	28	23
Keeping wages high . . . . .	60	21	19
Keeping farmers' income high . . . .	56	25	19
	Those in Which G.O.P. Has Advantage		
	Dem. Pct	Rep. Pct	No dif. Pct
Encouraging new business to start	36	43	21
Keeping taxes from getting too high	32	44	24
Keeping business profits high . . . . .	24	56	20
	Those in Which Opinion is Evenly Divided		
	Dem. Pct	Rep. Pct	No dif. Pct
Reducing strikes and labor trouble . . . . .	38	36	26
Running the government efficiently . . . .	37	38	25

The opinion vote on these questions—  
(CONTINUED ON PAGE 108)

## German Production Level in U. S. Zone Rising Slowly

Berlin

• • • Production at some level is reported for over 4000 industrial plants in the U. S. zone of Germany, according to U. S. military government officials. This figure represents the situation up to the end of 1945, and shows a 47 pct increase from the end of November. According to military government sources 53 pct of the plants operating are in consumer goods lines.

Despite the increase in number of plants technically regarded as in operation, there is actually as yet little production to show for the activity. An official estimate is that German industry is now operating at 10 to 12 pct of current capacity. The transportation situation remains in the eyes of the military government officials the primary problem to be solved. Currently inadequate sup-

See p. 80 for Additional German Steel News.

plies of coal, electric power and raw materials are attributed to the transport problems, but are said to be improving.

In the steel industry itself during the month of December in the U. S. zone production dropped off 713 metric tons from the previous month, due primarily to the holiday season. In the infinitesimal production of the zone at the present time this tonnage represents a 12 pct decrease. As during the previous months British authorities allotted 10,000 tons of steel from their zone to the U. S., and except for those tonnages used for rail and water transport needs,

By JACK R. HIGHT

• • •

German civil authorities were allowed to approve the end use of this steel.

Production of openhearth steel in the U. S. zone at the Haidhof plant, Maxmilianhuette, is estimated to have totaled 5100 metric tons in December as against 5813 tons for November. Rolling mill operations at the Haidhof plant also declined, being estimated at 2100 metric tons during December as compared with 2500 tons in November.

Military government authorities have declined to authorize any other major steel plant in the U. S. zone to begin operation due to the fuel shortage. Efforts are being made to obtain supplies of coal and coke from the Ruhr to resume operations in the production of foundry iron at Wetzlar and iron and steel production at the Sulzbach Rosenberg plant. Table I indicates the growth of steel production in the U. S. zone during the occupation.

An estimated maximum of 2500 metric tons of iron and steel castings was produced during the month of December. This production is at a rate of about 5 pct of the estimated current capacity of 50,000 metric tons. About half of the foundries in the American zone are currently listed as being in operation on some scale. Present production is principally railroad equipment, agricultural machinery, and spare parts and repairs for miscellaneous machinery. After starting at a pro-

duction in the zone of 590 metric tons in September, castings production increased to 2500 tons in October, and remained static at that point through the rest of the year.

The present monthly capacity of the forgings and stampings industry in the U. S. zone is approximately 10,000 metric tons. Output for December is estimated officially at 1500 to 2000 tons.

Although there is still no production or refinement of aluminum, copper, lead or tin in the American zone, there is a certain amount of fabrication from stocks going on. Statistics are not available for the quantities involved, after production amounting to about 400 tons in October. The estimated monthly capacity in the American zone in metric tons is about as follows: alumina, 8330; primary aluminum and silumin, 6420; primary magnesium, 550; and nonferrous fabrication, 8100.

The metals subcommittee of the Allied Control Authority has completed its studies on aluminum and magnesium, and made the following recommendations for the future control of the Germany light metals industry to the Control Authority:

(1) That the extraction or production of alumina for the purpose of producing aluminum be prohibited.

(2) That the production of primary aluminum be prohibited.

(3) That the production of aluminum alloys directly from ores or from concentrates of ore be prohibited.

(4) That the existing facilities for the production of primary aluminum and/or alumina for the purpose of producing aluminum and/or for the production of aluminum alloys direct from ores or concentrates of ores be declared available for removal as reparations or for destruction.

(5) That consumption of aluminum be set at a maximum of 30,000 metric tons per year, including both civilian consumption and actual use in Germany by Allied occupation forces.

(6) That production of metallic

TABLE I  
IRON AND STEEL PRODUCTION  
(U. S. Zone)

Production	Production					Estimated Monthly Capacity
	July and August	September	October	November	December	
			(Metric Tons)			
Pig Iron.....	0	0	0	0	0	45,800
Crude Steel.....	0	0	1,875	5,813	5,100	44,000
Rolled Steel.....	0	1,000	1,500	2,500	2,100	50,000



magnesium be prohibited.

(7) That all existing facilities for the production of magnesium be declared available for removal as reparations or for destruction.

(8) That consumption of magnesium be limited to 1000 metric tons per year.

The above recommendations have been accepted as the basic fundamentals for the light metals industry in Germany in the future by the joint control group as previously announced.

There was some increase in the activities of the machinery, equipment and optics industries in the American zone at the end of the year, but production of agricultural implements in December was only half that of the previous month. Present indications are that unless a flow of raw materials starts immediately to the implement plants, their activities will be restricted to repairs or they will be closed down. The estimated output in gross metric tons of all farm machinery dropped from 2500 tons in November to 1250 tons in December, and may not exceed 500 tons in January. This figure would correspond with the figure for June 1945. With several plants already having closed down due to a lack of raw materials, the same shortage is threatening the production of agricultural tractors. Table II compares recent farm machinery production in the zone with estimated needs for 1946.

**Activity in the plants producing machine tools and miscellaneous industrial equipment** increased somewhat during the last months of 1945. Many of the plants, however, that normally produce machine tools have shifted their activity to other lines. According to the report of the military governor repair work and the manufacture of household utensils are being carried on extensively. It is estimated that such work accounts for the bulk of the output of the 290 plants that are listed as having begun operations in December. Little large equipment of any kind was built in December.

Of the 216 machine tool plants in the U. S. zone, 86 (40 pct) were in operation in December, as against 60 (28 pct) in November, and 36 (17 pct) in September. There has been a steady and con-

TABLE II  
PRODUCTION OF AGRICULTURAL IMPLEMENTS  
(U. S. Zone)

Machines	Production					U. S. Zone Requirements First Quarter 1946
	August	September	October	November	December <sup>a</sup>	
Tractors .....	4	11	22	10	8	1,062
Threshers .....	144	255	118	181	55	875
Binders .....	243	63	61	0	0	875
Mowers .....	458	255	236	350	295	2,750
Cultivators .....	0	0	0	100	458	750
Drills .....	244	92	64	60	10	2,500
Harrow .....	187	85	147	50	39	10,000
Plows .....	1,496	332	225	250	1,756	10,749
Potato Tools .....	216	626	145	306	200	1,750
Rakes and Tedders .....	116	23	1	25	0	1,875
Ensilage Cutters .....	300	0	0	569	0	—
Hay Lifters .....	0	15	0	48	0	—
Rotary Tillers .....	100	100	0	30	0	—
Root Cutters .....	30	21	95	10	0	5,000
Hay Cutters .....	20	0	0	0	0	—
Carts and Wagons .....	4	14	20	17	0	3,750
Hand Rack Wagons .....	318	257	157	550	0	—
Rollers .....	0	11	0	0	0	875
Fertilizer Distributors .....	59	900	0	646	0	250
Estimated output in gross metric tons .....	1,250	1,750	2,000	2,500	1,250	—

<sup>a</sup> Preliminary.  
— Not available.

siderable increase in the number of plants in operation, but no similar increases in output, since many plants are engaged on repair jobs and production of spare parts and household wares. Some machine tools have been produced for high priority orders essentially for railroads and construction industries. A few small bench lathes are also being produced.

In related lines, the story of reopening for repair work and household utensils is almost monotonously similar. There is some bearing production, mainly again for the railways and the automotive plants that are in limited pro-

duction. In the cutting tools industry production consists largely of twist drills, taps, mechanical hand tools, dies and punches, with many plants occupied with repair and utensil work.

Some new calipers, dividers and micrometers are being produced by the precision gage makers, but no new mining nor metallurgical machinery is being made. Gas welding equipment works are producing both new machines and spare parts. Table III summarizes the machine tool and equipment production picture through December, although changes reported in a number of groupings during

TABLE III  
Machine Tools and Miscellaneous Industrial Equipment  
Plants in Operation (U. S. Zone)

Industry Group	Estimated Number Plants in Group	Number of Plants in Operation			
		September	October	November	December
Total .....	770	75	100	112	402
Machine Tools .....	216	36	56	60	96
Woodworking Machines .....	76	—	—	—	36
Physical Testing Machines and Equipment .....	14	0	0	0	11
Mechanical Transmission Machinery and Anti-friction Bearings .....	29	—	—	—	20
Material Handling Equipment .....	99	12	12	13	13
Metal Cutting Tools, Tool Holders, etc. .....	107	16	21	24	13
Measuring Tools and Gages .....	50	—	—	—	11
Mining and Metallurgical Equipment .....	66	—	—	—	8
Building and Road Construction Machinery .....	105	7	7	10	37
Gas Welding and Cutting Equipment .....	8	4	4	5	7

— Not available.

<sup>a</sup> Data not strictly comparable with earlier months due to reclassifications.

<sup>b</sup> Includes a number of plants not normally producing woodworking machinery.

the last month reported renders accurate comparison difficult.

Production of trucks in December in the U. S. zone amounted to 273 units, the highest output since the occupation. Daimler-Benz produced 237 units of the total, as against 148 in November. Due to a lack of tires and batteries, only 74 of the December production were delivered. The December figure of 273 brings the grand total for the zone since May 1945 to 1093.

Factory repairs to trucks in the U. S. zone continued at about the same rate as in November, over 400 vehicles being returned to service. The bulk of repair work is being done by the MAN works in Bavaria and the Open and Auto-Union works. As in earlier months, no passenger car production was undertaken in the U. S. zone in December, but factory repairs were made on over 300 units.

Output of spare parts and accessories is still very limited, but is reported to be increasing slightly. Many small and medium plants are devoting their facilities to this production, as well as to automotive repair work. The Opel works

at Russelheim, largest prewar producer of automobiles in Germany, currently are producing a line of over 600 different spare items against 400 in October.

Factory repairs is continuing to account for the bulk of the work done by locomotive and railroad car building firms. From May 1945 through September locomotive plants repaired and put back into service 265 locomotives of all types, including 35 American units. During the same period of time 169 passenger cars were repaired, and nearly all of them were delivered to the U. S. Army for use in leave trains.

In the month of December repairs on 331 freight cars were completed.

In the last eight months of 1945, 28 steam and three electric locomotives, all of which were on order at the time of the German collapse, were delivered in the U. S. zone. No post-collapse construction has been undertaken, and no new freight or passenger cars have been placed on order. There are some spare parts in production.

## Foundries Can Look To Ease of Labor Problem When Strikes Terminate

Washington

• • • Settlement of strikes in the auto, electrical and other industries will permit rapid resumption of hiring in iron foundries, reports from on-the-spot representatives of the United States Employment Service indicate, according to Robert C. Goodwin, director.

Many job openings existed in the foundries located in the Midwest and East when the strikes began. However, employment was increasing and with strikes' end the shortage of workers probably will continue to ease, employers reported to USES offices in the foundry areas.

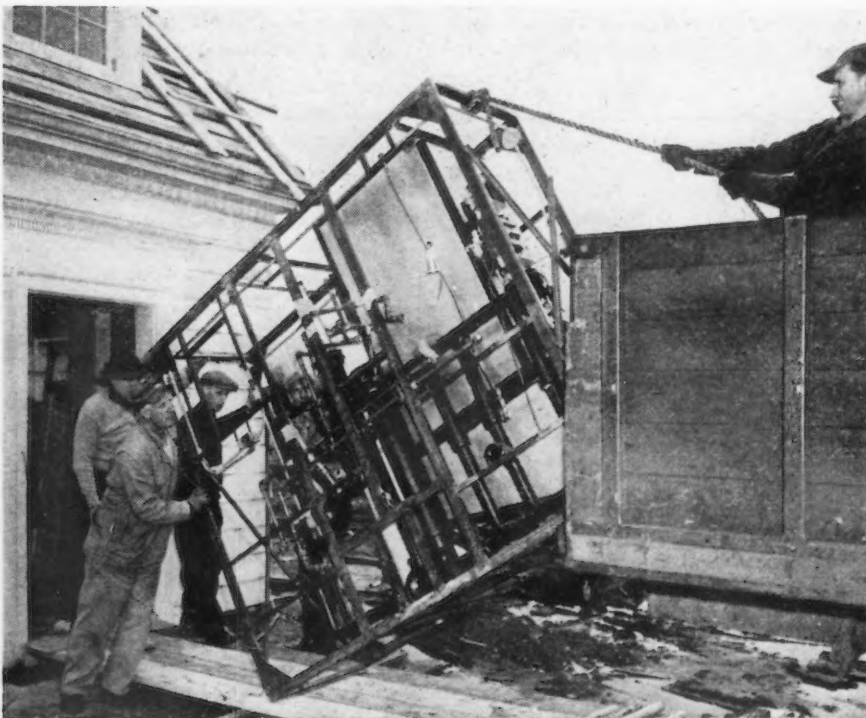
The strikes have seriously affected foundries supplying castings for producers of automobiles and various consumers' durable goods, such as household appliances, Mr. Goodwin said. Expansion of employment and output of foundries producing cast iron soil pipe, radiators, boilers, stoves and bathtubs is also expected to accompany the predicted boom in home and other essential construction. Shortage of these castings, he added, may affect the re-employment of large numbers of workers in the construction industry.

The primary factor in the lessening foundry labor shortage has been the return of World War II veterans, many of whom are skilled in foundry work and are returning to their old jobs. Inexperienced veterans are also applying for foundry jobs. Some are taking the on-the-job training courses to which they are entitled under the GI Bill of Rights. Another source of experienced help has come from displaced war plant workers with foundry experience who left the industry for higher wages in war plants before the fighting ceased.

The majority of foundry needs are for unskilled male laborers, though skilled molders and core-makers are generally in very short supply. In many plants lack of men with these skills prevented further hiring of other workers.

The most serious labor shortages were noted in Wisconsin. But general difficulty in filling current job openings in December were reported also from Illinois, Indiana and Pennsylvania.

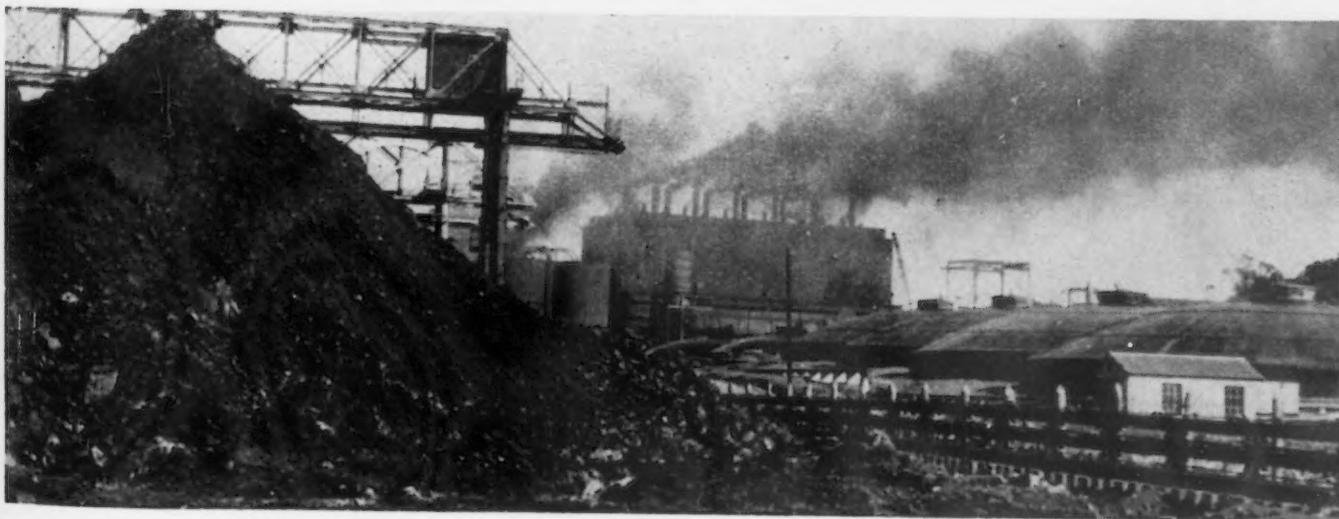
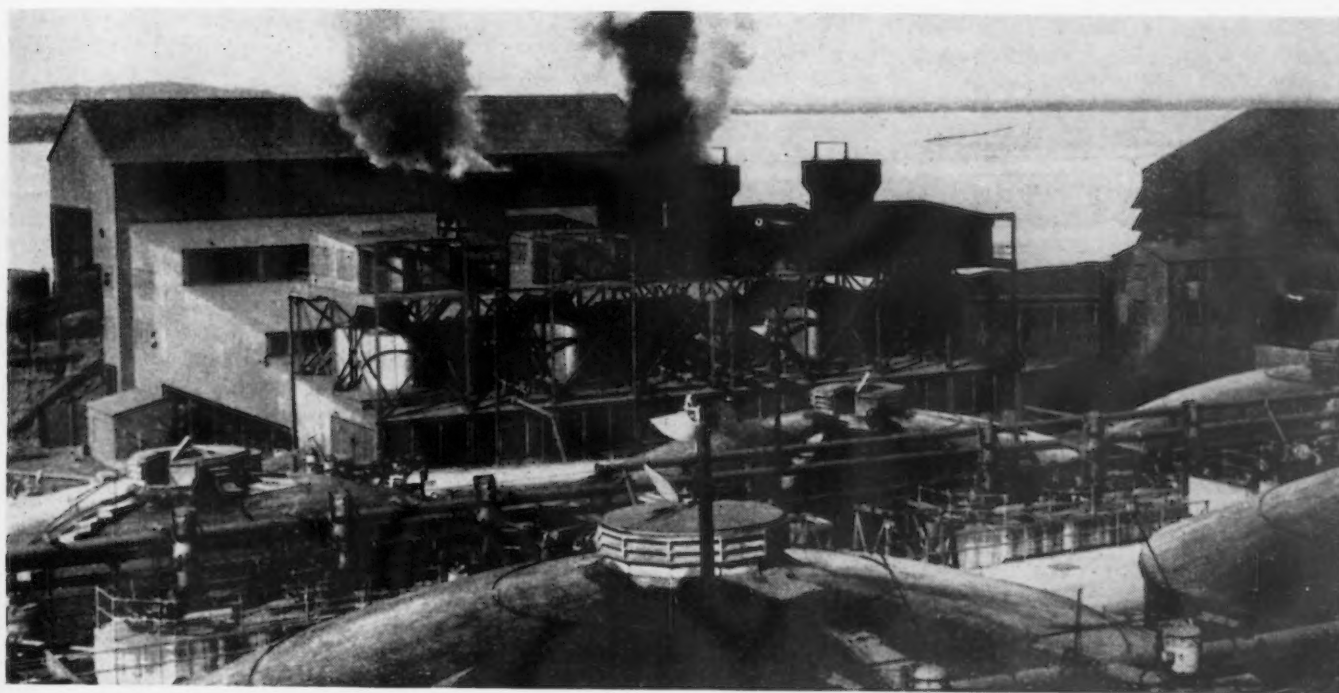
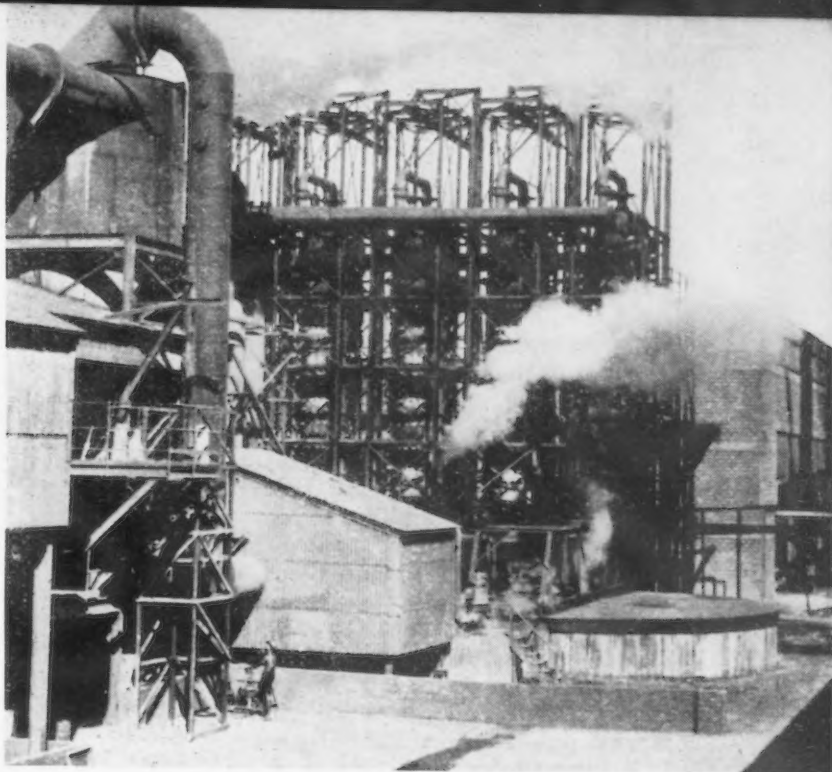
**HOUSE INTESTINES**—The home utility unit manufactured by Ingersoll Steel & Disc Division of Borg-Warner Corp. carries within a steel frame 30 by 90 by 77 in. gas or oil fueled furnace and water heater, flues to base of chimney, soil piping, copper hot and cold water pipes, and oil and gas pipes, electrical conduits, controls, circuit breakers, and connections. Installed, it forms a packaged core to which all appliance and plumbing fixtures of kitchen, laundry and bathroom may be assembled, with consequent saving of floor area.





## Nickel Oxide Production in Cuba

• • • Nickel additions to electric furnace steel can now be made with bagged nickel oxide produced from Cuban ore. These pictures show parts of the \$33.5 million War Assets Corp. plant which continues in operation by the Nicaro Nickel Co., a subsidiary of the Freeport Sulfur Co. Right, ammonia recovery plant; below, drying and grinding building; bottom, wet ore from the mines spread out to dry before processing.



## Kaiser Gets Five Year Lease On Two Spokane Aluminum Facilities

### Washington

• • • The proposal of two Kaiser companies to use aluminum extensively in the production of automobiles was the chief reason assigned by WAC for giving them five year leases on an annual rental basis on government owned aluminum plants at Spokane, Wash. The leases are subject to the approval of the Attorney-General. The Trentwood aluminum rolling mill was leased to the Kaiser-Frazer Corp., and the Mead aluminum reduction plant was leased to Kaiser Cargo, Inc. Both companies were given options to purchase the plants.

The Reynolds Metals Co., which bid for both plants, had offered what WAC said might have given a greater rental during the first four years of the lease, but it was declared that acceptance of the Kaiser offers was in greater conformity to the objectives of the Surplus Property Act—fostering the development of new independent enterprises and promotion of competition in the aluminum industry.

It was pointed out that the use of aluminum in the production of automobiles hitherto has been limited. Disposal of the two plants to the Kaiser companies, therefore, it was said, affords an opportunity to expand greatly the markets for aluminum and to promote the ultimate disposal of other aluminum plants.

Lt. Gen. Edmund B. Gregory, WAC chairman, said that these

leases will place a third producer in the primary aluminum industry in continuation of WAC policies to promote competition in aluminum. It was also pointed out that the Reynolds Co. is established in the aluminum industry and has arranged for the lease or purchase of four aluminum plants. Although Reynolds has withdrawn its bids for the lease of Chicago (McCook) aluminum rolling mill and the Troutdale aluminum reduction plant, it was explained that the company is eligible to re-submit bids for these plants and to bid for any other fabricating and reduction plants subject to disposal by WAC.

The Trentwood mill was built at a cost of \$47,630,000 and has a capacity of 288,000,000 lb annually. The Mead plant cost \$22,270,000 and has an annual capacity of 218,784,000 lb.

Under the terms of the Trentwood lease, the Kaiser-Frazer Corp. may terminate it at the end of the first year upon 90 days' prior written notice or at the end of any subsequent year upon six months' prior written notice.

The Kaiser-Frazer Corp. will pay taxes, insurance and maintenance and yearly rentals. For each of the first four years the rentals are fixed at specific sums or 5 pct of the gross sales, whichever shall be the higher. For the first year the specific rental is \$250,000; second year, \$660,000; third year, \$1,336,000; fourth year, \$2,000,000. For the fifth year the rental is

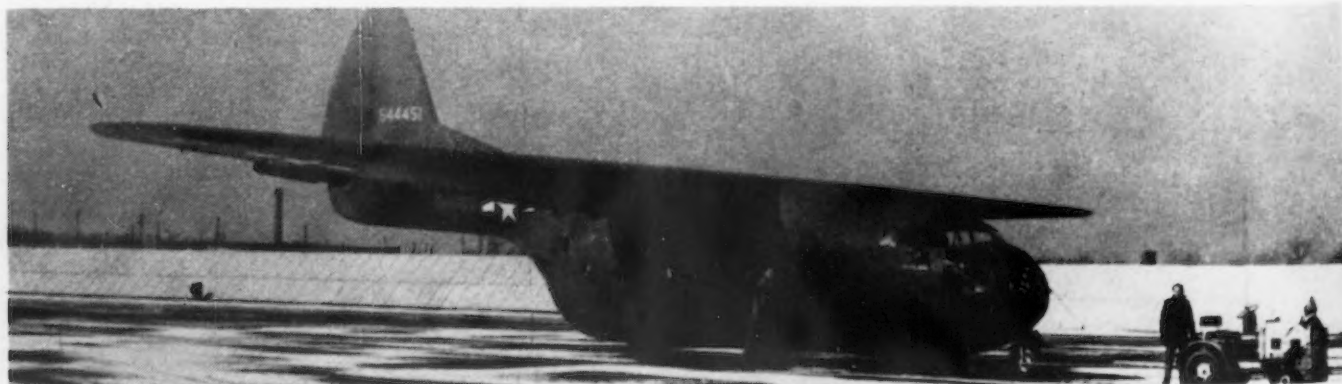
fixed at \$2,667,000. Provision is made that if rentals for the first four years are less than \$10,668,000, Kaiser shall during the fifth year pay 5 pct of the gross sales if the latter is greater than \$2,667,000, up to an amount equal to the difference between rentals actually paid and \$10,668,000.

The Mead lease also requires Kaiser Cargo to pay taxes, insurance and maintenance and rentals are fixed at specific sums; \$208,000 for the first year during which two pot-lines shall be available; \$260,000 for the second year during which two pot-lines shall be available; \$468,000 for the third year during which three pot-lines shall be available; \$728,000 for the fourth year during which four pot-lines shall be available and \$1,248,000 for the fifth year and any succeeding years in which the entire plant (six pot-lines) shall be available.

WAC pledged itself to use its best efforts to assist Kaiser Cargo in obtaining alumina from government-owned plants or if the latter are not in operation to negotiate with Kaiser Cargo for the operation by the latter of an alumina plant.

Should the electrode capacity of the reduction plant be insufficient to supply the full needs of the six pot-lines, the government may at its option: exclude such excess aluminum capacity from the agreement; construct at its cost sufficient additional electrode capacity required to meet the deficiency or supply Kaiser Cargo from outside sources, at the latter's cost of production an amount of electrodes necessary to meet such deficiency.

**CHANGEABLE:** This plane may either be an LK-12 cargo transport or a CG-10 Trojan Horse glider. Economical freight handling plus speed is combined in the airplane. The two power plants are easily removable for converting the airplane to a glider.





## OPA Absorption Policy Claimed To Result in Losses to Metal Firms

### Cleveland

• • • Charging that the past absorption policy of OPA in the stamping industry has resulted only in mounting losses since VJ-Day, Tom J. Smith, Jr., executive vice president of the Pressed Metal Institute, in a telegram to President Harry S. Truman, has asked that the stamping industry be granted a hearing before "a final distribution is made of labor or material increases as a result of the wage-price formula."

Mr. Smith's telegram also stated that "any further extension of such unsound policy will seriously retard the productivity of the important bottleneck stamping industry, still further delaying mass production reconversion."

Recently OPA handed down a ruling approving aluminum killed steel extras and allowing some stamping price revisions which Pressed Metal Institute, representing more than 160 metal stamping manufacturers, has been trying to obtain since November, 1945.

In a letter to PMI, Arthur H. Moran, price executive of OPA's machinery branch, gave the mill extra charges for special aluminum killed, and special requirement sheets, including deep drawing and extra deep drawing quality which are shown in the table.

According to Mr. Moran's letter, a stamper computing the price of metal stampings which do not have an established price within the meaning of Section 28 (1) of RMPR 136 should compute the price by the use of its base date pricing method (Mar. 31, 1942), and should compute the cost of the steel on the basis of the prices which were in effect on Mar. 31, 1942, for the grade or quality of steel being used for that particular job or stamping.

In the event special (aluminum) killed steel is specified and used, the cost of the steel should be computed on the basis of the base date cost of this grade, or the base date cost of regular commercial quality steel plus the extra approved charges for special (aluminum) killed as shown in the schedule.

The letter further states that the price of a stamping with an established price which was made from any of the aforementioned qualities of steel except "deep drawing quality" and where the specifications have been changed

the change to special (aluminum) killed steel should be reflected in the modified price.

This exception is made where special (aluminum) killed steel is used for "deep drawing quality" steel, because the extra charges for these grades are identical.

In his letter, Mr. Moran pointed out a change in specifications to special (aluminum) killed steel will not necessarily result in in-

Approved Mill Extra Charges  
Steel Sheets

Extra Charges per 100 lb.					
Gage Number	Regular Commercial Quality	Special Rimmed Quality	Special (Aluminum) Killed	Special Requirement	
				"Deep Drawing Quality"	"Extra Deep Drawing Quality"
12 or Heavier	None	None	\$0.15	\$0.15	\$0.25
12 to 21 Inclusive	None	None	.25	.25	.35
22 or Lighter	None	None	.35	.35	.45

to special (aluminum) killed steel may be modified or repriced in accordance with the provisions of Section 8 of RMPR 136 to reflect the appropriate increase or decrease. In such cases, OPA Form 694-2165, which is the form for reporting manufacturer's maximum prices of modified products, must be filed with OPA in accordance with the provisions of Section 8 of the regulation. The appropriate economies, if any, in labor and breakage resulting from

creased prices. The change in specifications from "extra deep drawing" quality will definitely result in lower selling prices. A change in specifications from "regular commercial quality" and "special rimmed quality" to "special (aluminum) killed quality" may result in higher or lower prices, depending upon the ratio of higher material costs versus the labor and breakage economies resulting from the use of the higher quality of steel.

## Toledo Creates Labor-Management Committee

### Toledo

• • • In an effort to increase industrial harmony in Toledo the City Council has approved an ordinance which creates a labor-management citizens committee intended to be "the directing body for the purpose of implementing and effectuating" the principles of the program.

The committee will consist of 18 members, six from labor, six from industry and six from the public. One of the public members will act as chairman, and all appointments will be for a term of one yr.

Six principles dominate the charter of the citizen's committee. These include recognition of the rights of employees to join labor organizations, and "the inherent right of management" to direct its operations.

Under this program an office of mediation, fact-finding and arbitration is created, whose facilities are available on joint application of the parties in any difference or disagreement. This office is directed to take steps at its discretion to settle any disputes which may adversely affect the welfare of the community, even though participants in the disputes have not requested the mediation or arbitration facilities available.

## Steel Buyers to Get Additional Billings When OPA Sets Price

Washington

• • • Pointing out that steel mills may bill customers at present ceiling prices with the proviso that the customer may pay the mill the difference between existing ceiling prices and the increased prices, OPA formally announced on Feb. 19 that, effective Feb. 15, it has been authorized by Stabilization Director John C. Collet to increase carbon and alloy steel products an average of \$5 a ton.

When the action of increasing the ceiling prices on an adjustable basis is issued, OPA said, it would be accompanied by a statement of consideration giving the grounds on which the action was found by the Price Administrator to fall within the bounds of the new wage policy. The directive of the Economic Stabilization directive requires OPA to issue the revised ceilings totaling 90 pct of the increases within two weeks from the date of its issuance, Feb. 5. The remaining one tenth increases are to be announced within five weeks from the date of the order.

OPA listed the following products which may be sold on an adjustable pricing basis:

Ingots.  
Forging billets and blooms. 1  
Rerolling billets and blooms.  
Slab.  
Sheet bar.  
Tube rounds.  
Shell steel (blooms and billets).  
Structural shapes (wide flange, standard).  
Steel piling.  
Plates (sheared, strip mill (unsheared) universal).  
Skelp (10 in. and narrower, wider than 10 in.)  
Rails (standard, light, girder, guard and high T.).  
Splice bars.

Tie plates.  
Bars—hot rolled (commercial quality, forging quality, special requirement quality).  
Concrete bars (new billet, rerolling).  
Hoops, bands and cotton ties.  
Wire—all kinds other than manufacturers wire.  
Woven and welded fence other than galvanized farm fence.  
Seconds.  
Forged and/or rolled steel sheets, gear blanks.  
Welded or woven wire mesh for reinforcement.  
Pipe (butt weld, black and galv., lap weld, electric weld seamless).  
Other pipe, tubing, conduit, couplings.  
Wire rods, all grades and sizes.  
Wire (manufacturers wire, nails and staples (bright), barbed wire, woven wire fence (galv. farm), bale ties).  
Fence posts.  
Black plate.  
Tinplate (hot dip, electrolytic, short ternes).  
Sheets (hot rolled, 18 gage and heavier, hot rolled, lighter than 18 gage, long ternes galvanized, cold rolled, enameling sheets, electrical sheets).  
Strip (hot-rolled, cold-rolled).  
Track spikes.  
Floor and miscellaneous special plates.  
Hot-rolled bars (other than commercial, forging and special requirement quality).  
Cold finished bars.  
Nails and staples, all kinds other than bright.  
Coated sheets other than galvanized.  
Tool steel.  
Car and locomotive axles.  
Woven wire cloth and wire netting but not products made thereof.  
Alloy rolled products of all shapes detailed above.

## Cl's Gary Strip Mill Adds Slab Heating Units

Pittsburgh

• • • Carnegie-Illinois Steel Corp. is building two new slab heating furnaces and rebuilding three existing slab heating furnaces at its Gary works, an expansion which will give its strip mill there one of the largest capacity ratings in the world.

The contract, awarded to Rust Furnace Co., Pittsburgh, includes machinery and foundations, and the work will be done without interrupting mill operations.

Each of the five furnaces, both new and rebuilt, will have a capacity of 105 tons an hr. This contrasts with a presently rated ca-

capacity of 60 tons an hr for the three existing furnaces, although they were run at a considerably higher figure during the war years.

The Gary contract makes possible for the first time maximum mill production on a continuous basis. No other hot strip mill is served by more than four slab heaters.

The five unit arrangement will materially improve furnace efficiency and life, eliminating need for running at over rated capacity. In such hot strip production generally, lack of sufficient furnace capacity has frequently proved a bottleneck.

The new and rebuilt furnaces have a heating rate in excess of 150 lb of steel per sq ft of effective hearth area per hr. They will heat slabs 3½ to 7½ in. thick; 18 to 76 in. wide; and 6 to 18 ft long.

All furnaces will be Rust triple-fired, zone controlled types, automatically operated in regard to furnace temperature, pressure and combustion. All will be fired with coke oven gas.

Alloy metal type recuperators, never before used with furnaces of such size and capacity, will deliver preheated air at 700° F to the furnaces. Waste gas will be converted to operate steam boilers, whose capacity will be enlarged to utilize the additional heating capacity. Each furnace will be equipped with suspended roofs.

The new furnaces are scheduled to be erected first, and set in operation. Then one of the existing furnaces will be torn down, rebuilt, and placed in operation. Finally, the two remaining existing furnaces will be rebuilt at the same time. Thus operations may be maintained at a high rate during the job.



**PAGE JOLLY ROGER:** Here is an RAF high-speed launch passing a Chinese junk at the end of a patrol while looking for modern-day pirates. Since the Jap surrender pirate junks have been doing a land office business in the Hong Kong - Kowloon area.



## Chile's Integrated Steel Plant Expected to Start Operations in 1948

### New York

• • • A completely integrated steel plant is to be established in Chile by the Compania de Acero del Pacifico. The plant will be built on San Vicente Bay near Concepcion—a location affording low-cost hydro-electric power, a well-protected harbor on deep water, a good supply of fresh water from the Bio Bio River and low cost of raw materials. Coal mines are 35 miles from the plant.

The plant will have a 47-oven battery byproduct coke plant complete with benzol and batch type tar plants, but will not include equipment for the production of ammonia sulfate. The ovens will be underfired with blast furnace gas; coke oven gas will be piped to Santiago where, due to transportation costs, coal for gas production sells at a premium.

The blast furnace will have a capacity of 500 tons per day. Steel production facilities will include a 500-ton mixer, a 60-ton open-hearth, a 50-ton electric furnace and a 12½-ton bessemer.

The main mill will consist of a two-high roughing mill with a three-stand finishing mill for the production of structurals, rails and bars. There will also be a merchant and rod mill for producing wire rods, bars and light structurals; also a wire mill. A 72-in. three-high plate mill stand will be installed to roll light plate and break-downs for sheet and tinplate which will be finished on two-high mills. These products will be produced alternately under the same roof in view of the relatively light tonnage involved. An electric-weld cold-formed pipe mill will be installed for the production of welded pipe from 2 in. to 4 in. Sizes below this are now being produced in other Chilean plants. An iron and steel foundry will have facilities for the production of centrifugal cast iron pipe in sizes up to 12 in.

Raw materials will arrive by boat and be unloaded by a traveling tower onto a belt conveyor running inshore along a 1500-ft pier to a crushing and screening plant.

Iron ore will come from El Tofo

mines, near Coquimbo, 450 miles north of Concepcion, and will be loaded into 10,000-ton carriers at the Bethlehem loading dock at Cruz Grande. This is the ore which has been used for years by Bethlehem at Sparrows Point. Limestone will come from Caleta Coloso, near Antofagasta, 750 miles north of the plant.

Coal, similar to the Utah coals of the U. S., will come from nearby mines. While Chilean coals produce a satisfactory coke, it is quite possible that initial operations will require a small percentage of U. S. coal for mixing with the Chilean coals in order to obtain a stronger coke. This practice will probably be discontinued as experience in coking Chilean coals is gained.

Hydroelectric power will come from the Abanico plant now nearing completion. It will be brought in at 150,000 v over a 100-mile transmission line, maximum load being 28,000 kw. A small diesel plant will be used as standby.

Water will be pumped at a rate of 25,000 gpm through a four-mile pipe line from the Bio Bio River.

This project is part of an overall plan for the industrial development of Chile, designed to make

it more self-sustaining and improve its financial position with respect to foreign exchange. The plant will require an operating personnel of 1500 to 2000 when operations are started in 1948. Chilean foreign exchange, at present derived largely from the exportation of copper and nitrate, will be benefited to the extent of \$10 million per year when steel products now being imported are produced locally.

### Piping Contract Awarded

#### Buffalo

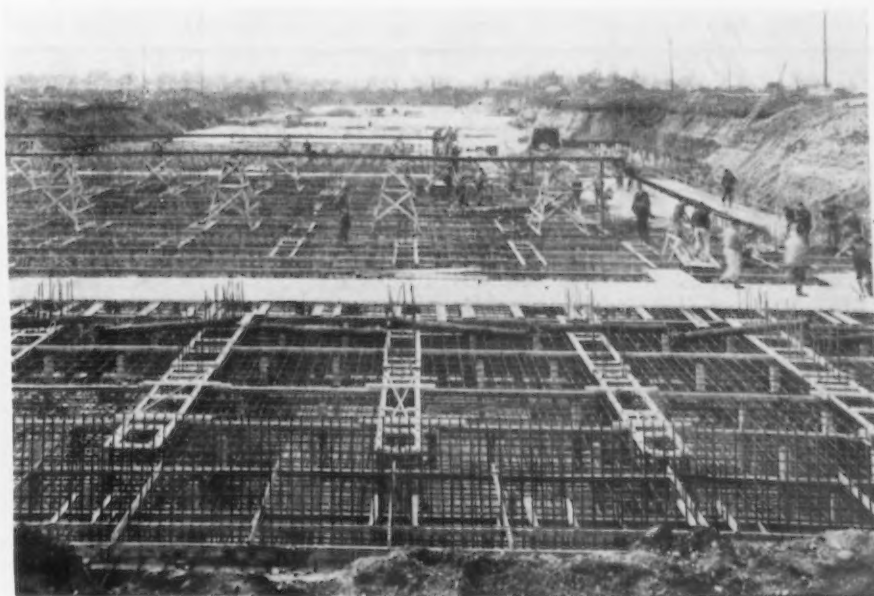
• • • The John W. Danforth Co., general mechanical equipment contractor, has been awarded a \$300,000 contract for installation of a chemical process piping system in the new Niagara Falls plant of the Pathfinder Chemical Co., subsidiary of Goodyear Tire & Rubber Co.

The contract calls for between 80 and 100 tons of noncorrosive pipe.

Operations of the Pathfinder plant, which plans an annual output of 3,000,000 lb of vinyl chloride for wire insulation, fabrics, floor and wall coatings, are scheduled to begin about Sept. 1.

Frank Manchester will be general superintendent and Stewart Dow resident engineer. Both are from Akron, Ohio.

**WORLD'S LARGEST:** Construction of a press pit 800 ft long, 160 ft wide and 29 ft deep to accommodate more than 100 presses, some of them weighing up to 1,000,000 lb each and capable of stamping out a turret top at a single blow is underway at the new stamping plant of the Fisher Body Div. of General Motors at Hamilton, Ohio.



## American and British Screw Thread Differences Discussed

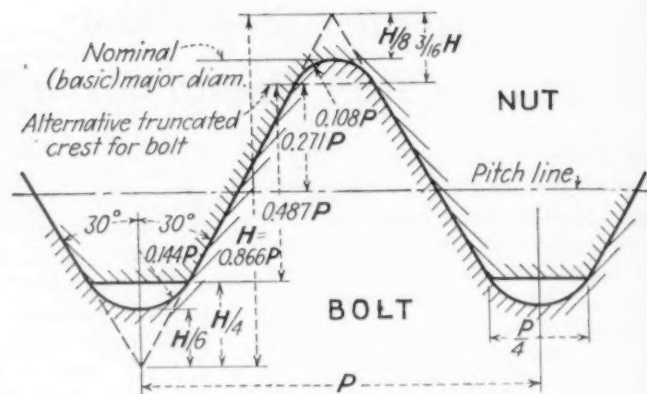


FIG. 1

### Washington

• • • During the past 30 years, several attempts have been made by Great Britain and the United States to resolve differences in screw thread designs that have existed for nearly a century. The British Whitworth system of screw threads, developed in 1841, is based on a 55° thread angle, while the American Sellers system adopted in 1864, employs a 60° angle.

In 1917, a British Committee considered a compromise angle of 57½° but no conclusive action was ever taken on this proposal. In 1918, an American Congressional committee conferred with British and French engineers but nothing definite came of the meeting. In 1926, the British submitted another proposal involving the 57½° angle, a compromise which was not found acceptable in this country and no further action was taken.

In 1943, British, Canadian, and American delegates discussed the problem, especially with regard to its effect in war production, and from this meeting a joint Combined Production and Resources Board United States-Canadian Mission met in London in 1944. Their recommendations were that United States complete a War Emergency Standard for American National Threads with rounded roots, the United Kingdom and Canada to issue corresponding standards; and that the national standardizing bodies of the three countries proceed with a program of research to determine the optimum form of threads.

At a meeting in Ottawa, Canada, during September and October 1945, a proposed basic screw thread form was announced and discussed by representatives of the three countries. The "Report of the Conference on Unification of Engineering Standards, Ot-

tawa, 1945" describes this basic form.

As indicated in the drawing, fig. 1, the truncation of  $H/8$  ( $H$  being the height of the basic triangle) at the crest would correspond to a basic crest radius of about  $0.108p$ , and a truncation of  $H/6$  of the basic triangle would correspond to a basic root radius of about  $0.144p$  (approximating the existing Whitworth radius). It was proposed that the truncation line of the optional flat crest be established at a distance of  $3/16H$  below the apex of the basic triangle, and the truncation at the minor diameter of the nut at a distance of  $H/4$  above the apex of the inverted basic triangle. As the root radius, it was pointed out that advantage might be taken of a certain amount of rounding off of figures in order to get the best possible radius consistent with a satisfactory amount of flank engagement, for the purpose of having sufficient strength from the

TABLE I  
Small Screw Thread Series—Proposed Basic Screw Thread Form  
(60° included angle)

Designation	Basic Major Diameter		Pitch, Mm.	Approximate T.P.I.*
	Mm.	In.		
039†	1.00	0.0394	0.25	102
043	1.10	0.0433	0.25	102
047†	1.20	0.0472	0.25	102
051	1.30	0.0512	0.25	102
055†	1.40	0.0551	0.30	85
059	1.50	0.0591	0.30	85
067†	1.70	0.0669	0.35	72½
071	1.80	0.0709	0.35	72½
079†	2.00	0.0787	0.40	63½

\* Multiple relationships of 127.  
† Preferred Sizes.

TABLE II  
Small Screw Thread Series—  
Proposed Basic Screw Thread  
Form (60° included angle)

Designation	Basic Major Diameter, In.	Threads per Inch	
		Coarse	Fine
086	0.086	56	64
099	0.099	48	56
112	0.112	40	48
125	0.125	40	44
138	0.138	32	40
164	0.164	32	36
190	0.190	24	32
220	0.220	24	28



static as well as dynamic point of view.

The British delegation agreed that from both technical and economic standpoints, the standard should have the following characteristics: 1-A contained angle of 60°; 2-A basic form with a radius at root of a magnitude approximating that at present associated with the Whitworth Standard and a radius at crest equal to about 0.108 times the pitch; 3-A truncated minor diameter of nut; 4-A major diameter of screw truncated on an optional basis. The American delegation indicated that this appeared to be acceptable as a proposal to be placed before American industry and expressed the belief that, supplemented by suitable tolerances and allowances, it would provide a satisfactory system of interchangeable screw threads for the three countries concerned.

The subcommittees on screw thread series considered the recommendation relating to screw thread series (diameter-pitch relationships) and considered the

desirability of linking up any tables that might be established for these series with the requirements of the instrument screw thread field. Accordingly they prepared tables which contained the following recommendations:

- (1) That there should be only one diameter-pitch series covering the range of sizes 0.0394 to 0.787 in. diameter as set out in table I.
- (2) That a coarse diameter-pitch series should be established covering the range of sizes 0.086 to 0.220 in. diameter shown in table II, and the range of sizes 0.25 to 4 in. diameter given in table III.
- (3) That a fine diameter-pitch series be established covering the range of sizes 0.086 to 0.220 in. diameter shown in table II and the range of sizes 0.25 to 4 in. diameter given in table III.
- (4) That, in view of the absence of sufficient evidence of need for an extra fine screw thread series, coupled with the lack of sufficient data on which to develop a suitable table for such a series, no recommendation was to be offered at this time.

TABLE III  
Regular Screw Thread Series—  
Proposed Basic Screw Thread  
Form  
(60° included angle)

Nominal Size, In.	Basic Major Diameter, In.	Threads per Inch	
		Coarse	Fine
1/4	0.250	20	28
5/16	0.3125	18	24
3/8	0.375	16	24
7/16	0.4375	14	20
1/2	0.500	12	20
9/16	0.5625	12	18
5/8	0.625	11	18
3/4	0.750	10	16
7/8	0.875	9	14
1	1.000	8	12
1 1/8	1.125	7	12
1 1/4	1.250	7	12
1 3/8	1.375	6	12
1 1/2	1.500	6	12
1 3/4	1.750	5	
2	2.000	4 1/2	
2 1/4	2.250	4 1/2	
2 1/2	2.500	4	
2 3/4	2.750	4	
3	3.000	4	
3 1/4	3.250	4	
3 1/2	3.500	4	
3 3/4	3.750	4	
4	4.000	4	

## Fabricators Remain On Strike as Mills Open

Pittsburgh

• • • The steel-using fabricators are still in the middle. This was the conclusion reached by the Tri-state Industrial Assn., after the members studied the wage-price policy announced by the government for the "settlement" of the steel strike. The company members of the association employ approximately 50,000 in the Pittsburgh industrial area. There are 750 other fabricating companies in the country, employing more than 350,000.

"The Tristate Industrial Assn. has warned from the beginning of this strike that our problems were entirely different from those of the United States Steel Corp. and other basic steel companies," declared Ray Booth, secretary of the association.

"Our companies use steel—they do not make it. They have to buy the steel they use from the basic steel companies. We have repeatedly warned that any settlement with basic steel could not apply to us.

"Now basic steel has been granted a \$5 a ton increase for the steel they sell to us. With this relief, they have felt they could afford to give a wage increase of 18½c an hr to their employees and have signed agreements with that provision.

"But the fabricators now are required to pay an average of \$5 more a ton for the steel they use, and are supposed to pay increased wages besides. Almost without exception, the fabricators have been seeking price relief for themselves for months because they already were losing money on the products they made. Now, not only do they have to pay more for their steel, but they don't know how much more. The government has said only that the \$5 is an 'average' increase. The price increase for some steel may be set at one dollar a ton. The new price on other kinds of steel may be \$9 or more. But the important point is: The steel-using fabricators who are the only buyers, don't know!

"Can these companies be expected to open up their plants, continue to lose money, and finally

just have to shut down forever because they were forced into bankruptcy? The steel strike is not over for the small steel-using companies, the fabricators.

"Until official Washington comes out and tells them how much more they are going to have to pay for their raw material; until Washington announces and gets into operation a workable plan for giving the fabricators immediate price relief on their own products, simultaneously with the granting of a wage increase, very few of these companies will be able to reopen.

"These companies have been placed in a very bad light with the public and with their individual employees. It will be easy for the public to say: 'If the U. S. Steel Corp. can pay their workers 18½c an hr and reopen their plants, why can't these other companies?'

"When Washington announces a policy, and sets up machinery to carry it out, so that these companies can reopen without losing money, the steel strike will be over. Indications are that this may take many more weeks or even months."

## Industrial Briefs...

• **FOREIGN REPRESENTATIVE**—Lempco International, Inc., will represent Lovejoy Tool Co., Inc., Springfield, Vt., in the foreign markets, in selling their industrial metal cutting tools.

• **FORM NEW FIRM**—Joseph A. Weiger, vice-president of P. R. Mallory & Co., Inc., and Henry D. Weed, Jr., manager of the Resistance Welding Alloy Div. of the company, have resigned to form a new manufacturing firm, the Weiger Weed & Co., to specialize in resistance welding electrodes, electrical contacts and special metallurgical products. Headquarters of the new company will be in Detroit at 11644 Cloverdale Ave. where office and production facilities have been established.

• **NEW ELECTRODE**—A new all-position mild steel electrode, called Airco No. 312, has been announced by Air Reduction Sales Co., New York. It was designed primarily to prevent underbead cracking in the welding of hardenable steels.

• **NAMES SUBSIDIARY**—Buffalo Bolt Co., of North Tonawanda, N. Y., has announced the incorporation of Buffalo International Corp. with J. C. Walker as president. A wholly owned subsidiary, the Buffalo International will handle all overseas selling for the parent company and subsidiaries.

• **PIG IRON DEALER MOVES**—Bauer, Wilson & Bateman, dealers in pig iron, fluorspar, and ferroalloys, have moved from 310 S Michigan Ave. to 134 S LaSalle St., Chicago 3.

• **BUYS DIVISION**—B. F. Goodrich Co. has purchased the airplane, wheel and brake div. of Hayes Industries, Inc. In acquiring this division, Goodrich will now supply complete tire, tube, wheel and brake assembly for the aircraft industry.

• **PLANS NEW PLANT**—E. I. du

Pont de Nemours & Co., Inc., announced it will construct a new \$1,000,000 unit for production of pyroxylin type of nitrocellulose at its Carney's Point, N. J., plant, with operations to begin by the end of 1946.

• **NEW RESEARCH CENTER**—International Harvester Co. has announced the establishment of a manufacturing research project devoted to the improvement of manufacturing methods and procedures for its entire line. The research done at the new center will supplement the manufacturing research going on at individual Harvester plants.

• **FOR SALE**—War Assets Corp. has offered for sale or lease the \$18,000,000 plant operated by the Cleveland Pneumatic Aerol, Inc., Euclid and the \$420,000 plant of the Pipe Machinery Co., Cleveland. Other Ohio plants for sale or lease are the \$9,000,000 Columbus precision parts plant used by the Timken Roller Bearing Co., the \$6,000,000 unit of the Ohio Steel Foundry Co. in Lima and a \$260,000 foundry in Marion operated by the Osgood Co.

• **BRANCH OFFICE**—Metal Carbides Corp., Youngstown, has announced opening of its branch office, warehouse and service plant at 166 Bloomfield Ave., Newark, N. J. A full stock of standard tungsten carbide tools, dies and wear-resistant parts is maintained at Newark, as well as specialized equipment to re-grind, rework or repair parts to specifications.

• **FORMS EXPORT CONCERN**—Formation of World Trade, Inc., an export-import concern, dealing in metals, building materials, plumbing supplies, household appliances and other articles, has been announced by Lt. Col. J. Albert Roesch, president, and John H. Crosby, vice-president. Offices are located at 38 S Dearborn St., Chicago.

## Republic Reports Net Income Drops in '45

Cleveland

• • • **Republic Steel Corp.** has reported consolidated net income for 1945, after all deductions including provision for federal income and excess profits taxes, totaled \$9,543,443 compared with \$10,130,296 for 1944.

Sales in 1945 amounted to \$500,815,000 compared with \$531,235,000 in 1944, and the rate of production was 79.2 pct in 1945, 20.6 pct lower than the 99.8 pct of 1944.

Republic earnings for 1945 were at the rate of \$1.36 per share of common stock, compared with \$1.44 in 1944, and were approximately 4 pct on investment and slightly less than 2 pct on sales.

Provision for federal income and excess profits taxes in 1945 was \$15,952,608, compared with \$31,400,000 in 1944.

At their meeting in New York, Republic directors declared a dividend of \$1.50 per share on the 6 pct cumulative convertible prior preference stock, Series A, payable Apr. 1, 1946, to stockholders of record Mar. 9, 1946. The board also declared a dividend of 25¢ per share on the common stock of the corporation, payable Apr. 2, 1946, to stockholders of record Mar. 9, 1946.

Resignation of J. F. Schoellkopf, Jr., of Buffalo, who has been a member of the Republic board since 1930, was also announced. C. R. Black, Jr., New York, was elected a director to fill the vacancy.

## Gallup Polls

(CONTINUED FROM PAGE 99)

tions ranged from 10 to 14 pct.

While the Republican Party has registered some gains in the above questions since October, the findings underline the Republican Party problem of convincing the voters that it represents primarily the interests of the common man.

Voters incline to think that the Republican Party is the one to handle the problems having to do with business and finance. The Democratic Party is viewed as the one better able to keep wages up for workers and income up for farmers; it is thus viewed as primarily the party which represents the people.



## Construction Steel...

### New York

••• Fabricated steel awards this week included the following:

- 10,500 Tons, Terminal Island, Calif., Cerritos Channel bridge, to American Bridge Co., Pittsburgh.
- 3350 Tons, Point Pleasant, W. Va., Baltimore & Ohio railroad bridges, to American Bridge Co., Pittsburgh.
- 1520 Tons, between Ainsworth and Brighton, Iowa, Rock Island Railway bridges, to American Bridge Co., Pittsburgh.
- 1350 Tons, Peoria, Ill., Pabst Brewing Co. building to Mississippi Valley Structural Steel Co., Decatur, Ill.
- 900 Tons, Los Angeles, U. S. Gypsum Co., mill building, to Kansas City Structural Steel Co., Kansas City, Kan.
- 400 Tons, Hammond, Ind., plant for Lever Bros., to American Bridge Co., Pittsburgh.
- 350 Tons, Aurora, Ill., Barber-Greene Co., factory building, to Mississippi Valley Structural Steel Co., Decatur, Ill.
- 100 Tons, Mare Island, Calif., various structures, Reserve Fleet Berthing, Navy Yard, through Peter Kiewit Sons' Co., to Independent Iron Works.

••• Fabricated steel inquiries this week included the following:

- 10,000 Tons, Cleveland, General Motors Corp., assembly plant.
- 5000 Tons, Cleveland, General Motors Corp., machine shop and boiler house.
- 3300 Tons, New York, Fishman Realty & Construction Co., office building.
- 3000 Tons, Oroville, Calif., State of California transmission towers.
- 850 Tons, Redding, Calif., four regulating gates for spillway at Keswick Dam, Central Valley Project; American Bridge Co., Denver, low bidder.
- 115 Tons, Cascade, Idaho, relocation Idaho Northern Branch, Oregon Short Line RR, to Cascade Reservoir, Boise Project, Bureau of Reclamation, Boise, bids due Feb. 28.

••• Reinforcing bar awards this week included the following:

- 1200 Tons, Mare Island, Calif., various structures, Reserve Fleet Berthing, Navy Yard, through Peter Kiewit Sons' Co., to Judson-Pacific-Murphy Corp.
- 563 Tons, State of Alabama, for bridges and structures in state highway program, distributed among 12 contractors.
- 250 Tons, Milwaukee, foundations, Blatz Brewing Co. building, to Joseph T. Ryerson & Son, Inc., Chicago.
- 250 Tons, Fort Dodge, Iowa, Tobin Packing Co. plant, to Ceco Steel Products Corp., Omaha, Neb., through W. A. Klinger, Sioux City, Iowa, general contractor.
- 250 Tons, Buena Vista County, Iowa, state highway paving to Bethlehem Steel Co., through Pramme & Jensen Construction Co., Des Moines, general contractor.
- 210 Tons, Linn County, Iowa, state highway paving, to Bethlehem Steel Co., through Central Engineering Co., Davenport, Iowa, general contractor.
- 150 Tons, Milwaukee, Sears, Roebuck & Co., to Ceco Steel Products Corp., Chicago.
- 150 Tons, Kankakee, Ill., Armstrong Cork Co. plant, to Joseph T. Ryerson & Son, Inc., Chicago, through J. L. Simmons Co., Decatur, Ill., general contractor.
- 140 Tons, Glendale, Calif., reinforced concrete reservoir, Melwood District, through F. W. Case, to Blue Diamond Corp.
- 130 Tons, Lakeview, Wis., Kimberley Clark Corp., to Cook & Brown Lime Co.
- 125 Tons, Greencastle, Ind., Lone Star Cement Co., to Carnegie-Illinois Steel Corp., Pittsburgh.
- 100 Tons, Cedar Rapids, Iowa, Cherry-Bur-

rell Corp. building, to Laclede Steel Co., St. Louis, through Weitz Co., Des Moines, Iowa, general contractor.

••• Reinforcing bar inquiries this week included the following:

- 2100 Tons, Chicago, R. R. Donnelley & Sons Co. printing plant building.
- 735 Tons, Boston, Boston University.
- 485 Tons, West Virginia and Kentucky, Dewey Dam.
- 350 Tons, Toledo, Ohio, Standard Oil Co., separators.
- 315 Tons, Estherville, Iowa, Tobin Packing Co., plant.
- 300 Tons, Chicago, Consolidated Biscuit Co., plant.
- 180 Tons, Rollinsville, Colo., Denver & Salt Lake RR.
- 160 Tons, Port Washington, Wis., Harnischfeger Corp.
- 146 Tons, San Bernardino Co., Calif., paving and reinforced concrete bridges between Vineyard and Etiwanda Aves., California Div. of Highways, Los An-

## Unprecedented Number Of Exhibitors Reserve Space at Foundry Show

Chicago

••• Predictive that the Golden Jubilee Foundry Show to be staged in Cleveland May 6-10 in conjunction with the 50th anniversary convention of the American Foundrymen's Assn. will be the largest exposition of castings industry equipment and materials in history is the recent announcement that the show has already outgrown original floor plans and that to meet the unusual demand for space the association has made the Arena area of the Cleveland Auditorium available to exhibitors.

Opening of the Arena, initially planned as a lounge and restaurant, increases to more than 116,000 sq ft the space allotment for exhibitors. Earliest plans for the show were on an unprecedented foundry equipment exposition scale with more than 100,000 sq ft in the auditorium's Exhibit, North and Lakeside halls and the Arcade arranged for the booths of those who supply the castings industry.

The unusual interest of foundry equipment and supply companies in the 1946 A.F.A. exposition reflects not only eagerness to disclose developments and refinements made during the security-restricted days of the war and to dramatize contributions to the giant-stride advancement of the foundry industry over the past half century, but also recognition of the fact that the foundry industry, literally run on

geles, bids due Mar. 21.

- 145 Tons, Chicago, Sinclair Refining Co.
- 130 Tons, Chicago, Great Lakes Plating & Japanning Co.
- 125 Tons, Wellington, Kans., courthouse.
- 120 Tons, Charleston, Ill., Eastern Illinois State College.

••• Sheet piling awards this week included the following:

- 1290 Tons, Chicago, Calumet Park shore protection, 732 tons to Inland Steel Co., Chicago, and 558 tons to Carnegie-Illinois Steel Corp., Chicago, through Great Lakes Dredge & Dock Co., Chicago, general contractor.

••• Steel rail inquiries this week include the following:

- 2800 Tons, Cascade, Idaho, relocation Idaho Northern Branch, Oregon Short Line Railroad, to Cascade Reservoir, Boise Project, Bureau of Reclamation, Boise, bids due Feb. 28.

its bearings under pressures of four yr of wartime operation, plans a large amount of rehabilitation, replacement and repair to refit itself for peacetime production. Indications that the 50th anniversary convention of the association will set a new attendance record is also a factor in the heightening interest of those who sell to the castings industry.

## Radiator Co. Asks For Ease in Price Ceilings

Johnstown, Pa.

••• The National Radiator Co., is hopeful a practical basis can be developed for the reopening of its plants. However, because of an OPA price restriction, the company is in a different category than the basic steel producing companies who have worked out agreements with their employees.

Robert S. Waters, president, claimed that prior to the strike, the company was selling its major products for less money than they cost to manufacture, due to OPA price ceilings, so that every shipment showed a loss.

Mr. Waters stated, "I don't know the answer. For six months we have been doing our level best to get OPA to realize that a manufacturer can't continue to run his plant if his only reward is dissipation of his working capital. This kind of practice eventually leads to one thing, and that is a final suspension of operations. To date, OPA has failed to correct the price situation."

# MACHINE TOOLS

... News and Market Activities

## Lack of Components Cripples Industry

### Cleveland

• • • Because of a shortage of anti-friction bearings, electric motors and controls, the machine tool industry is rolling slowly to a stop, according to competent observers here.

Warner & Swasey Co., which shut down for all intents and purposes about two weeks ago for a lack of these components, is still hamstrung and operating only the planer dept. and tool room. As matters now stand, company officials can see little change in the situation for at least three weeks.

By and large, builders are running on rapidly diminishing inventories of bearings at the moment, and there is little doubt in some quarters that another week or ten days will see a number of them following in Warner & Swasey's footsteps.

With the price increase situation still a hypothetical question and subject to any of OPA's many changes of heart and mind, the production picture in the months ahead must almost of necessity include some allowance for labor and the demands that will inevitably come, primarily inspired by the recent steel wage increase. A case in point is the strike that broke out at Gisholt Machine Co., Madison, Wis., involving about 4000 workers recently.

Current surplus developments can be blanketed by the statement that machines are pouring into War Asset Corp. hands faster than they can be sold; however, there is a wide divergence of opinion among informed observers as to the number of machines being "withheld," a term broadly applied to any machine or machines which, while ultimately scheduled for surplus, have not yet been made available. One source holds that this is the result of a double inventory procedure, or in other words, a duplication of effort, between War Assets Corp. and the Ordnance Dept., for example. Proponents of this position submit that WAC should accept the inventory of any branch of the service and get the machines on the

market. The other opinion is that WAC is unwilling to "cannibalize" a complete tool room, by selling selected items, and is holding all the equipment in certain plants off the market in the hope of a "lump" sale. Locally at least, concrete evidence to support either charge is yet to be presented formally.

Local market developments include a growing scramble for tool room equipment, an interesting adjunct to other reconversion difficulties. Prior to the war, the average plant looked upon its tool room as little more than overhead, often as not. Now, possibly as part of the cost-cutting pattern and war experience, tool room equipment is among the top-demand items.

Sale of the Cincinnati Planer Co. to a group of Cincinnati businessmen under the aegis of Sidney G. Rose, president of the Cleveland Wrecking Co. here and head of Rose Brothers Co., Cincinnati, has been announced. According to reports, Cincinnati Planer has on the book a sizeable order for planers for the Soviet government.

Negotiations for the sale of the company to Giddings & Lewis Machine Tool Co. were instituted a number of years ago, but the transaction did not materialize. Sale of Cincinnati Planer to Mr. Rose and his associates, however, like the recent sale of Sommer & Adams to Federal Machine & Welder Co., continues the trend of mergers, sales and consolidations in the machine tool industry following the end of the war, and paralleling the developments which took place after World War I.

On the foreign market front, some idea of the situation in Holland can be had from the remarks of the country's prime minister, Dr. Schermerhorn, in a recent interview with Dewitt Mackenzie, Associated Press staff writer.

Said Prime Minister Schermerhorn: "Our shortage is in machinery and machine tools. The Germans took away everything we had, even the machinery in our two

large railway repair shops. So we are unable either to get industry under way or to repair our crippled transportation until we can import machines and tools.

"We want to get these necessities from America, and the only reason we have not purchased them already is because for the time being we have no dollars available. Actually we have in the United States funds amounting to several hundred million dollars, but these were impounded pending investigation to make sure that no enemy money was involved. With the release of these assets we shall be able to take up again the purchase of at least part of our most urgently needed machinery."

Sources here disclose that a few machines from surplus have been sent over to Holland, doubtless not nearly enough to even make a mark in the Dutch dilemma, monetary aspects of which are the result of having guilders instead of dollars.

## Inquiries Holding Up Well

### New York

• • • Despite the fact that business for the current month has been slightly below that of the past month, inquiries for new machines appear to be holding up well. Some surplus machines are passing through dealers' hands, but they are not too happy about them because of the never ending red tape still involved.

It happens far too frequently that after a machine has been inspected and a quotation made, it is found not to be surplus after all, and the whole deal must be called off. There is a strong feeling that if all surplus machines could be plainly labeled with name, age, and price, negotiations would be much simpler, and sales more easily effected.

Deliveries of standard new machines are improving to the point where many are available at 4 to 6 weeks, provided special tooling is not required. Special machines and special tooling, however, are still in the 6 to 8 month delivery state, as also are all types of presses, brakes, and shears.



# JET PROPULSION TURBINES

## by BROACHING



### Step 2

Broaching by *American* is a fast, accurate, economical method of production. Again and again during the war, industry turned to broaching, the *American* way, to solve metal finishing problems and speed output of the weapons of Victory.

One such problem was the shaping of slots in jet propulsion turbines. For cutting rough slots of proper depth and spacing, an *American* SB-66-15 Vertical Surface Broaching Machine was equipped with a three stage broach assembly.

Each member of the assembly made progressively deeper cuts. The part, with two slots partially cut, was placed in the ma-

chine so that the shallow slot came to the center broach and the slightly deeper one came to the right-hand broach. Then the part was automatically indexed with all three broaches cutting shallow, deeper, and full depth slots respectively.

Broaching the *American* way, can help speed output and reduce costs in your plant. Let *American's* complete broaching service — machines, tools, and engineering — work for you. Write today for more information. There is no charge.



WATCH THIS PAPER for another operation in broaching jet propulsion turbines. Step 3—Finishing—will be described in *American's* April 25th advertisement. The first step was described in the December 27th issue.



MEMBER  
**BROACHING TOOL  
INSTITUTE**

*American*  
**BROACH AND  
MACHINE CO.**

ANN ARBOR, MICHIGAN

BROACHING MACHINES  
PRESSES  
BROACHING TOOLS  
SPECIAL MACHINERY



# NONFERROUS METALS

... News and Market Activities

## Strikes Hit Lead;

### Bill May Up Price

New York

• • • Reports from the trade indicate that the supply position for lead is likely to become more acute than recently with the closing down Monday of a total of 18 plants of the American Smelting & Refining Co. because of the strike of the International Mine, Mill & Smelter Workers Union, of which many are lead producers. However, slight improvement is expected since the conclusion of the strike of Mexican lead miners and the beginning of shipments to this country.

It is reported that the Tin, Lead & Zinc Division of CPA is working on another revision of the lead order designed to limit consumption during the second quarter.

One of several measures introduced into Congress dealing with the extension of the Premium Price Plan for nonferrous metals, the McFarland Bill in the Senate is the only one that contemplates an increase in the prices of these metals which would relieve the government of subsidy payments by authorizing increased prices which in the case of lead would reach 8.15¢ per lb delivered New York.

## Zinc Ordering Opens

New York

• • • Zinc is in good supply and with the reopening of the steel mills, orders are beginning to come into suppliers again. Special High Grade is reported to continue tight and demand for Prime Western is high.

## Mixed Solid Floor Price

Washington

• • • The minimum of regulation consistent with the equitable distribution of aluminum scrap was recommended to WAC by its advisory committee of aluminum scrap dealers at a meeting Feb. 20.

Changes in the classification of various grades of contaminated

aluminum scrap and the floor prices established by SPA Regulation 12 to permit a readier flow of material into industrial channels were discussed with WAC officials. The dealers suggested that the classification of "solids mixed with foreign materials" now having a floor price of 4¢ would present a more realistic position with a floor price of 2½¢ a pound. A separate classification of scrap with a high percentage of contamination was suggested, with all other grades to remain as is.

## Extend Lead Premiums

Washington

• • • Relaxing restrictions of the premium price quota plan, CPA, as a means of increasing production, has allowed lead mine producers who started operations after Oct. 27, 1943, to become eligible, retroactive to Feb. 1, for the same premium payments as the old producers. The premium will apply to producers who come within the "B" range, whose quota offers an extra 2.75¢ per lb over the "A" quota ceiling of 6.50¢ plus 2.75¢ premium, or up to 12¢ for excess production above the quota when the additional premium is shown to be warranted. Previously lead producers who started operations after Oct. 27, 1943, were not permitted to participate in the "B" quota.

## Lead Packing Extras

Washington

• • • Effective Feb. 25, OPA has announced the following specific charges in cents per ton which sellers of primary lead may make for special packing and loading:

For pig lead wired or strapped, 30¢.

For lead in ingots or linked ingots wired or strapped on wooden pallets, 50¢.

For lead in ingots or linked ingots wired or strapped on steel pallets, 70¢.

OPA said that the additional changes are to be stated separately in the seller's invoice.

## Extruded Metals Plant

### Leased to Reynolds Co.

Washington

• • • The War Assets Corp. has announced that the aluminum extrusion plant formerly operated by Extruded Metals, Inc., Grand Rapids, Mich., will be leased to the Reynolds Metals Co., Richmond, Va. The Reynolds Co. expects to use the plant in producing extruded aluminum products and anticipates employing about 450 persons. An option permits the company to buy all but not part of the plant and to cancel the lease at the end of the second year or at the end of any succeeding year upon 90 days' written notice.

WAC appraisers reported that the present reproduction cost of the land and buildings is \$2,133,177. After allowance for depreciation WAC estimates that the fair value of land and buildings is \$1,964,531 and that the fair value of machinery and equipment on the premises is \$2,500,000.

The lease provides for a rental equal to 4 pct of the net sales of all products made in the plant with a guaranteed annual minimum rental of \$140,000 the first two years; \$250,000 the third year and \$350,000 the fourth year.

## Cadmium To Be Restricted

New York

• • • Cadmium is in extremely short supply and, although no longer under allocation, it has been reported that the government is considering an order restricting consumption. Members of the industry are eager to avoid any prospect of having the metal returned to allocation because of the difficulties involved in that procedure.

## Antimony in Demand

New York

• • • Antimony continues in heavy demand under allocation. There is no evidence that this picture may soon be relieved by appreciable importation from the Orient.



# NONFERROUS PRICES

## Primary Metals

(Cents per lb., unless otherwise noted)

Aluminum, 99+%, del'd (Min. 10,000 lb.)	15.00
Aluminum pig	14.00
Antimony, American, Laredo, Tex.	14.50
Beryllium copper, 3.75-4.25% Be; dollars per lb. contained Be	\$14.75
Beryllium aluminum, 5% Be; dollars per lb. contained Be	\$30.00
Cadmium, del'd	90.00
Cobalt, 97-99% (per lb.)	\$1.50 to \$1.57
Copper, electro, Conn. valley	12.00
Copper, electro, New York	11.75
Copper, lake	12.00
Gold, U. S. Treas., dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$ 2.25
Iridium, dollars per troy oz.	\$90-\$100
Lead, St. Louis	6.35
Lead, New York	6.50
Magnesium, 99.9 + %, carlots	20.50
Magnesium, 12-in. sticks, carlots	27.50
Mercury, dollars per 76-lb flask, f.o.b. New York	\$103 to \$106
Nickel, electro	35.00
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per oz.	\$35.00
Silver, New York, cents per oz.	70.75
Tin, Straits, New York	52.00
Zinc, East St. Louis	8.25
Zinc, New York	8.65

## Remelted Metals

(Cents per lb.)

Aluminum, No. 12 Fdy. (No. 2)	9.00 to 10.00
Aluminum, deoxidizing	
No. 2, 3, 4	7.25 to 10.00
Brass Ingot	
85-5-5-5 (No. 115)	13.25
88-10-2 (No. 215)	16.75
80-10-10 (No. 305)	16.00
No. 1 Yellow (No. 405)	10.25

## Copper, Copper Base Alloys

(Mill base, cents per lb.)

	Extruded Shapes	Rods	Sheets
Copper	20.87		20.37
Copper, H.R.	17.37		
Copper drawn	18.37		
Low brass, 80%	20.40	20.15	
High brass		19.48	
Red brass, 85%	20.61	20.36	
Naval brass	20.37	19.12	24.50
Brass, free cut		15.01	
Commercial bronze, 90%		21.32	21.07
Commercial bronze, 95%		21.53	21.28
Manganese bronze	24.00		28.00
Phos. bronze, A, B, 5%		36.50	36.25
Muntz metal	20.12	18.87	22.75
Everdur, Herculey, Olympic or equal		25.50	26.00
Nickel silver, 5%		28.75	26.50
Architect bronze	19.12		

## Aluminum

(Cents per lb., subject to extras on page, size, temper, finish, factor number, etc.)

Tubing: 2 in. O.D. x 0.065 in. wall 2S, 40c. (1/2 H); 52S, 61c. (O); 24S, 67 1/2 c. Plate: 0.250 in. and heavier: 2S and 3S, 21.2c.; 52S, 24.2c.; 61S, 22.8c.; 24S, 24.2c. Flat Sheet: 0.188 in. thickness: 2S and 3S, 22.7c. a lb.; 52S, 26.2c.; 61S, 24.7c.; 24S, 26.7c.

2000-lb. base for tubing; 30,000-lb. base for plate, flat stock.

Extruded Shapes: "As extruded" temper: 2000-lb. base, 2S and 3S, factor No. 1 to 4, 25.5c.; 14S, factor No. 1 to 4, 35c.; 17S, factor No. 1 to 4, 31c.; 24S, factor No. 1 to 4, 34c.; 53S, factor No. 1 to 4, 28c.; 61S, factor No. 1 to 4, 28 1/2 c.

The factor is determined by dividing perimeter of shape by weight per lineal foot.

Wire Rod and Bar: Base price; 17ST and 11ST-3, screw machine stock. Rounds: 1/4 in., 28 1/2 c. per lb.; 1/2 in., 26c.; 1 in., 24 1/2 c.; 2 in., 23c. Hexagonals: 1/4 in., 34 1/2 c. per lb.; 1/2 in., 28 1/2 c.; 1 in., 25 1/2 c.; 2 in., 25 1/2 c. 2S, as fabricated, random or standard lengths, 1/4 in., 14c. per lb.; 1/2 in., 25c.; 1 in., 24c.; 2 in.,

23c. 24ST, rectangles and squares, random or standard lengths, 0.093-0.187 in. thick by 1.001-2.000 in. wide, 33c. per lb.; 0.751-1.500 in. thick by 2.001-4.000 in. wide, 29c.; 1.501-2.000 in. thick by 4.001-6.000 in. wide, 27 1/2 c.

## NONFERROUS SCRAP METAL QUOTATIONS

(OPA basic maximum prices, cents per lb., f.o.b. point of shipment, subject to quality, quantity and special preparation premiums—other prices are current quotations)

### Copper, Copper Base Alloys

#### OPA Group 1†

No. 1 wire, No. 1 heavy copper	9.75
No. 1 tinned copper wire, No. 1 tinned heavy copper	9.75
No. 2 wire, mixed heavy copper	8.75
Copper tuyeres	8.75
Light copper	7.75
Copper borings	9.75
No. 2 copper borings	8.75
Lead covered copper wire, cable	6.00*
Lead covered telephone, power cable	6.04
Insulated copper	6.10*

#### OPA Group 2†

Bell metal	15.50
High grade bronze gears	13.25
High grade bronze solids	11.50*
Low lead bronze borings	11.50*
Babbitt lined brass bushings	13.00
High lead bronze solids	10.00*
High lead bronze borings	10.00*
Red trolley wheels	10.75
Tinny (phosphor bronze) borings	10.50
Tinny (phosphor bronze) solids	10.50
Copper-nickel solids and borings	9.25
Bronze paper mill wire cloth	9.50
Aluminum bronze solids	9.00
Soft red brass (No. 1 composition)	9.00
Soft red brass borings (No. 1)	9.00
Gilding metal turnings	8.50
Contaminated gilded metal solids	8.00
Unlined standard red car boxes	8.25
Lined standard red car boxes	7.75
Cocks and faucets	7.75
Mixed brass screens	7.75
Red brass breakage	7.50
Old nickel silver solids, borings	6.25
Copper lead solids, borings	6.25
Yellow brass castings	6.00
Automobile radiators	7.25
Zincy bronze borings	7.00
Zincy bronze solids	8.00

#### OPA Group 3†

Fired rifle shells	8.00
Brass pipe	7.25
Old rolled brass	6.75
Admiralty condenser tubes	7.25
Muntz metal condenser tubes	6.75
Plated brass sheet, pipe reflectors	6.25
Manganese bronze solids	7.00†
Manganese bronze solids	6.00†
Manganese bronze borings	6.25†

#### OPA Group 4†

Refinery brass	4.50*
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\*Price varies with analysis. †Lead content 0.00 to 0.40 per cent. ‡Lead content 0.41 to 1.00 per cent.

## Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb. or more, 46c. a lb.; 25 to 90 lb., 56c.; less than 25 lb., 66c.

### Other Copper Alloys

Briquetted Cartridge Brass Turnings	8.625
Cartridge Brass Turnings, Loose	7.875
Loose Yellow Brass Trimmings	7.875

### Aluminum\*

#### Plant scrap, segregated

2S solids	8.00
Dural alloys, solids 14, 17, 18, 24S	
25S	4.00
turnings, dry basis	3.00
Low copper alloys 51, 52, 61, 63S solids	7.25
turnings, dry basis	5.75

#### Plant scrap, mixed

Solids	4.00
Turnings, dry basis	2.75

#### Obsolete scrap

Pure cable	8.00
Old sheet and utensils	6.00
Old castings and forgings	5.00
Pistons, free of struts	5.00
Pistons, with struts	3.00
Old alloy sheet	5.00

## Magnesium\*

#### Segregated plant scrap

Pure solids and all other solids, exempt	
Borings and turnings	1.50

#### Mixed, contaminated plant scrap

Grade 1 solids	3.00
Grade 1 borings and turnings	2.00
Grade 2 solids	2.00
Grade 2 borings and turnings	1.00

\*Nominal.

## Zinc

New zinc clippings, trimmings	6.50
Engravers, lithographers plates	6.50
Old zinc scrap	4.75
Unswaged zinc dross	5.00
Die cast slab	4.50
New die cast scrap	4.45
Radiator grilles, old and new	3.50
Old die cast scrap	3.00

## Lead

Deduct 0.55c. a lb. from refined metal basing point prices or soft and hard lead including cable, for f.o.b. point of shipment price.

## Nickel

NI content 98+%, Cu under 1/4%, 33¢ per lb.; 90 to 98% NI, 23¢ per lb. contained NI.

## ELECTROPLATING ANODES AND CHEMICALS

### Anodes

(Cents per lb., f.o.b. shipping point in 500 lb. lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	25 1/4
Electrodeposited	18 1/4
Rolled, oval, straight	19 1/4
Curved	20 1/4
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	23 1/4
Zinc, cast, 99.99, 15 in. or longer	16 1/4
Nickel, 99 per cent plus, frt. allowed	
Cast	47
Rolled, depolarized	48
Silver, 999 fine	
Rolled, 100 oz. lots, per oz.	80

### Chemicals

(Cents per lb., f.o.b. shipping point)

Copper cyanide, 1-5 bbls.	34.00
Copper sulphate, 99.5, crystals, bbls.	7.75
Nickel salts, single, 425 lb. bbls., frt. allowed	13.50
Silver Cyanide, 100 oz. lots, per oz.	0.6083
Sodium cyanide, 96 per cent, domestic, 100 lb. drums	15.00
Zinc cyanide, 100 lb. drums	33.00
Zinc sulphate, 89 per cent, crystals, bbls., frt. allowed	6.35

## OPA Restricts Broker-Dealer Setup

### Washington

• • • Effective Feb. 25, OPA has changed its regulation governing the sale of iron and steel scrap which makes it illegal for a purchaser of scrap to act both as a dealer and a broker in the same transaction where the combination results in a price in excess of established ceiling prices. OPA said its action was taken because of sales of large tonnages of scrap by various government agencies, including the Army and Navy.

A distinction has always been drawn in the industry between the dealer and broker functions, OPA pointed out. Purchases by dealers are exempt from price control. However, a dealer may not sell scrap to consumers at higher than ceiling prices. The dealer's normal function is to collect scrap in his yard, sort it, grade it, prepare it for use and transport it to a consumer.

A broker, on the other hand, functions purely as an agent for a consumer. He purchases scrap and ships it directly from the point of accumulation to the consumer. Such scrap does not pass through a dealer's yard. For his services, a broker may charge a consumer 50¢ per gross ton.

"In a sale of 10,000 tons of scrap, a buyer might bid the applicable ceiling price for 9000 tons, and higher for the remaining 1000 tons," OPA said. "The first bid, before today's action, he might submit as a broker, the second as a dealer. The result would be an average price for the entire lot higher than the applicable maximum price.

"Bids of this type," OPA added, "disrupt the normal flow of scrap, exert pressures on ceiling prices, and threaten the entire structure of price control in the iron and steel scrap industry. It is this type of practice which today's action will eliminate."

**PITTSBURGH**—Reports on the availability of scrap are rather conflicting, but it is certain that there is no oversupply in any one grade. Turnings are very slow while all grades of cast are

scarce and 18-in. rails for foundries have almost reached the critical stage. The power strike called for Pittsburgh again this week will shut down most of the yards, since their presses, cranes, shears, and other mechanical equipment operate from Duquesne Light Co. power. Mills are gradually increasing operations, but their scrap stocks are still ample. It will be another two weeks or so before a real pinch will develop on scrap.

**CHICAGO**—Refusal of major consumers to take unprepared scrap, alloys, and loose turnings will continue until scrap dammed up by the strike can be unloaded, although one mill now is accepting some loose turnings. All prime open-hearth grades still command ceiling prices, with every indication that full springboard will be paid. Local production scrap is appearing only in dribbles and movement of nearby country scrap is slow. Expected increased mill demand for blast furnace grades has not materialized, but bundlers are supporting full ceiling on turnings. The recent OPA dealer-broker ruling has little immediate significance in the local market.

**PHILADELPHIA**—The end of the steel strike has not resulted in any appreciable change in the market situation here since only two additional eastern Pennsylvania mills have called for shipments at the early part of the week. These are in addition to the mills that have been taking scrap during the strike. A number of local mills are reported not yet to have concluded an agreement with the union. Scrap is as tight as ever here with some yards calling for unprepared scrap so as to keep in operation. Contrary to last week's report, Bethlehem continues to take on scrap at Easton and Sparrows Point.

**DETROIT**—The market here continues unchanged, with dealers and brokers pushed for deliveries and with supply definitely limited. General belief is that as long as the General Motors strike effects continue, the supply of scrap in virtually all grades will be very short in this market.

**BOSTON**—With the U. S. Steel Co. labor controversy settled, mills generally released shipments standing on books of brokers and yards, but forwardings have been limited due to shortage of material and snow and ice. Foundries report pig iron about as hard to get as cast and low phos. Larger percentages of high silicon pig than usual have been necessary in some instances. For that reason castings are not always satisfactory to users.

**NEW YORK**—The scrap situation continues much the same in this area as was reported last week. Since scrap-producing mills have not as yet been able to swing into full production, scrap receipts are still at a low ebb. Demand is once more on the upgrade, however, with

consumer mills back in the market. The heavy snowfall the past week added to the dealers' headaches. Prices continue firm at ceiling.

**BUFFALO**—Removal of strike restrictions on shipments to area steelmakers has emphasized the acute shortage of scrap in dealers' hands. Detroit, Valley and Canadian consumers pulled a considerable tonnage out of the Buffalo scrap shed during the stoppage, paying full ceilings and freight. The Canadians are inquiring for more scrap, particularly foundry grades, making the point that contacts established now may stand sellers in good stead "when U. S. markets ease off." Dealers have booked some orders from regular customers, but are inclined to pass up new accounts under present conditions.

**ST. LOUIS**—Steel mills in the St. Louis industrial district which had halted shipments of scrap iron because of the strike, are now accepting them, even paying demurrage, when the cars can't be unloaded so as to be certain to get the much-needed material. The supply continues short. Steel-using plants have less scrap because their operations were curtailed. Some railroad scrap is coming through, but this, too, has been curtailed because of limited work in the shops due to the shortening of the supply of steel with which to make repairs. Prices are unchanged.

**CLEVELAND**—In the virtual absence of production scrap, demand continues to exceed supply. Shipments are at a low ebb, but sufficient to replace whatever inroads post-strike operations have made into mills' redundant inventories. Offerings of termination inventory material continue, but the cream is gone and much of the material available now is alloy. Another offering of landing mats is reported at Norfolk, Va., but the closing of the Pennsylvania Railroads lists was notable in the lack of heavy melting.

**BIRMINGHAM**—With railroads having lifted an embargo against shipments to mills, a measure resulting from the steel strike, a decided improvement in the movement of scrap for the next 30 days is expected in this area. Demand is brisk for all grades and all available tonnages are being taken by consumers in the district. Prices remain firm and unchanged.

**TORONTO**—Canadian scrap iron and steel prices remain unchanged at ceiling levels, while consumers unhesitatingly are paying tops for all available supplies. Fresh scrap offerings continue to dwindle and the supply situation steadily is becoming more acute. Local dealers see no indications of early improvement and the majority have no surplus stocks on hand, and depend on daily receipts to maintain shipments to consumers. Industrial scrap is providing the bulk of new supply at this time with no materials moving from the rural districts.



# IRON AND STEEL SCRAP PRICES

## PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$20.00*
RR. hvy. melting	21.00*
No. 2 hvy. melting	20.00*
RR. scrap rails	21.50*
Rails 3 ft. and under	23.50*
No. 1 comp'd sheets	20.00*
Hand bld. new shts.	20.00*
Hvy. axle turn.	19.50*
Hvy. steel forge turn.	19.50*
Mach. shop turn.	15.00*
Short shov. turn.	17.00*
Mixed bor. and turn.	15.00*
Cast iron borings	16.00*
Hvy. break cast.	16.50*
No. 1 cupola	20.00*
RR. knuck. and coup.	24.50*
RR. coil springs	24.50*
Rail leaf springs	24.50*
Rolled steel wheels	24.50*
Low phos. bil. crops	25.00*
Low phos.	22.50*
RR. malleable	22.00*

## CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$18.75*
No. 2 hvy. melting	18.75*
No. 1 bundles	18.75*
No. 2 dealers' bndls.	18.75*
Bundled mach. shop turn.	18.75*
Galv. bundles	16.75*
Mach. shop turn.	13.75*
Short shovels, turn.	15.75*
Cast iron borings	14.75*
Mix. borings & turn.	13.75*
Low phos. hvy. forge	23.75*
Low phos. plates	21.25*
No. 1 RR. hvy. melt.	19.75*
Reroll rails	22.25*
Miscellaneous rails	20.25*
Angles & splice bars	22.25*
Locomotive tires, cut	24.25*
Cut bolsters & side frames	22.25*
Standard atl. car axles	25.75*
No. 3 steel wheels	23.25*
Couplers & knuckles	23.25*
Agricul. malleable	22.00*
RR. malleable	22.00*
No. 1 mach. cast.	20.00*
Rails 3 ft. and under	22.25*
No. 1 agricul. cast.	20.00*
Hvy. breakable cast.	16.50*
RR. grate bars	15.25*
Cast iron brake shoes	15.25*
Stove plate	19.00*
Clean auto cast.	20.00*
Cast iron carwheels	20.00*

## CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.50*
No. 2 hvy. melting	19.50*
No. 1 bundles	19.50*
No. 2 bundles	19.50*
Mach. shop turn.	\$10.50 to 11.00
Shoveling turn.	12.50 to 13.00
Cast iron borings	11.50 to 12.00
Mixed bor. & turn.	11.50 to 12.00
Low phos. plate	22.00*
No. 1 cupola cast.	20.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Scrap rails	21.00*

## BOSTON

Dealers' buying prices per gross ton, f.o.b. cars

No. 1 hvy. melting	\$15.05*
No. 2 hvy. melting	15.05*
No. 1 and 2 bundles	15.05*
Busheling	15.05*
Turnings, shoveling	12.05*
Machine shop turn.	10.05*
Mixed bor. & turn.	10.05*
C'n cast, chem. bor.	\$13.06 to 14.15*

Truck delivery to foundry

Machinery cast.	21.00 to 23.51*
Breakable cast.	21.57 to 21.87*
Stove plate	20.00 to 23.51*

## DETROIT

Per gross ton, brokers' buying prices:

No. 1 hvy. melting	\$17.32*
No. 2 hvy. melting	17.32*
No. 1 bundles	17.32*
New busheling	17.32*
Flashings	17.32*
Mach. shop turn.	12.32*
Short shov. turn.	14.32*

Going prices as obtained in the trade by IRON AGE editors, based on representative tonnages. Where asterisks are used on quotations below, this indicates a ceiling price to which must be added brokerage fee and adjusted freight.

Cast iron borings	13.32*
Mixed bor. & turn.	12.32*
Low phos. plate	19.82*
No. 1 cupola cast.	20.00*
Charging box cast.	19.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Automotive cast	20.00*

## PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$18.75*
No. 2 hvy. melting	18.75*
No. 2 bundles	18.75*
Mach. shop turn.	13.75*
Shoveling turn.	15.75*
Cast iron borings	14.75*
Mixed bor. & turn.	13.75*
No. 1 cupola cast	20.00*
Hvy. breakable cast	16.50*
Cast, charging box	19.00*
Hvy. axle forge turn.	18.25*
Low phos. plate	21.25*
Low phos. punchings	21.25*
Billet crops	21.25*
RR. steel wheels	23.25*
RR. coil springs	23.25*
RR. malleable	22.00*

## ST. LOUIS

Per gross ton delivered to consumer:

Heavy melting	\$17.50*
Bundled sheets	17.50*
Mach. shop turn.	12.50*
Locomotive tires, uncut.	\$18.50 to 19.00
Misc. std. sec. rails	19.00*
Rerolling rails	21.00*
Steel angle bars	21.00*
Rails 3 ft. and under	21.50*
RR. springs	22.00*
Steel car axles	24.50*
Stove plate	19.00*
Grate bars	15.25*
Brake shoes	15.25*
RR. malleable	22.00*
Cast iron carwheels	20.00*
No. 1 machinery cast	20.00*
Breakable cast	16.50*

## BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$17.00*
No. 2 hvy. melting	17.00*
No. 2 bundles	17.00*
No. 1 busheling	17.00*
Long turnings	12.00*
Shoveling turnings	14.00*
Cast iron borings	13.00*
Bar crops and plate	\$18.50 to 19.50*
Structural and plate	18.50 to 19.50*
No. 1 cast	19.00*
Stove plate	19.00*
Steel axles	18.50*
Scrap rails	18.50*
Rerolling rails	20.50*
Angles & splice bars	20.50 to 21.00
Rails 3 ft. & under	21.00*
Cast iron carwheels	17.50 to 18.00

## YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$20.00*
No. 2 hvy. melting	20.00*
Low phos. plate	22.50*
No. 1 busheling	20.00*
Hydraulic bundles	20.00*
Mach. shop turn.	15.00*
Short shov. turn.	17.00*
Cast iron borings	16.00*

## NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$15.33*
No. 2 hvy. melting	15.33*
Comp. black bundles	15.33*
Comp. galv. bundles	15.33*
Mach. shop turn.	10.33*
Mixed bor. & turn.	10.33*
Shoveling turn.	12.33*
No. 1 cupola cast	20.00*

Hvy. breakable cast	16.50*
Charging box cast	19.00*
Store plate	19.00*
Clean auto cast	20.00*
Unstrip. motor bika.	17.50*
C'n chem. cast bor.	14.33*

## BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.25*
No. 1 bundles	19.25*
No. 2 bundles	19.25*
No. 2 hvy. melting	19.25*
Mach. shop turn.	14.25*
Shoveling turn.	16.25*
Cast iron borings	14.25*
Cast iron borings	15.25*
Mixed bor. & turn.	14.25*
Stove plate	19.00*
Low phos. plate	21.75*
Scrap rails	20.75*
Rails 3 ft. & under	22.75*
RR. steel wheels	23.75*
Cast iron car wheels	20.00*
RR. coil & leaf spgs.	23.75*
RR. knuckles & coup.	23.75*
RR. malleable	22.00*
No. 1 busheling	19.25*

## CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.50*
No. 2 hvy. melting	19.50*
Compressed sheet stl.	19.50*
Drop forge flashings	19.00
No. 2 bundles	19.50*
Mach. shop turn.	14.50*
Short shov. turn.	16.50*
No. 1 busheling	19.50*
Steel axle turn.	19.00*
Low phos. billet and bloom crops	24.50*
Cast iron borings	15.50*
Mixed bor. & turn.	14.50*
No. 2 busheling	17.00*
No. 1 machine cast	20.00*
Railroad cast	20.00*
Railroad grate bars	15.25*
Stove plate	19.00*
RR. hvy. melting	20.50*
Rails 3 ft. & under	23.00*
Rails 18 in. & under	24.25*
Rails for rerolling	23.00*
Railroad malleable	22.00*
Elec. furnace punch	22.00*

## SAN FRANCISCO

Per gross ton delivered to consumer:

RR. hvy. melting	\$15.00 to 15.75
No. 1 hvy. melting	15.00 to 15.75
No. 2 hvy. melting	14.00 to 14.75
No. 2 bales	12.50 to 13.25
No. 3 bales	8.50 to 9.25
Mach. shop turn.	7.00
Elec. furn. 1 ft. und.	15.50 to 17.00
No. 1 cupola cast.	19.00 to 21.00

## LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$13.00 to \$14.25
No. 2 hvy. melting	12.00 to 13.25
No. 1 bales	12.00 to 13.00
No. 2 bales	11.00 to 12.00
No. 3 bales	8.00 to 9.00
Mach. shop turn.	4.50
No. 1 cupola cast.	19.00 to 21.00

## SEATTLE

Per gross ton delivered to consumer:

RR. hvy. melting	\$10.00
No. 1 & No. 2 hvy. melting	10.00
Elec. furn. 1 ft. und.	\$14.00 to 15.00
No. 1 cupola cast.	20.00*

## HAMILTON, ONT.

Per gross ton delivered to consumer:

Heavy melting	\$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	18.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushelings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*

# Comparison of Prices . .

Advances over past week in Heavy Type; declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel:	Feb. 26, 1946	Feb. 19, 1946	Jan. 22, 1946	Feb. 27, 1945
(cents per pound)				
Hot-rolled sheets	2.20	2.20	2.20	2.10
Cold-rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.70	3.70	3.70	3.50
Hot-rolled strip	2.10	2.10	2.10	2.10
Cold-rolled strip	2.80	2.80	2.80	2.80
Plates	2.25	2.25	2.25	2.10
Plates, wrought iron	3.80	3.80	3.80	3.80
Stain's c-r strip (No. 302)	28.00	28.00	28.00	28.00

Tin and Terneplate:	Feb. 26, 1946	Feb. 19, 1946	Jan. 22, 1946	Feb. 27, 1945
(dollars per base box)				
Tinplate, standard cokes	\$5.00	\$5.00	\$5.00	\$5.00
Tinplate, electrolytic	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30

Bars and Shapes:	Feb. 26, 1946	Feb. 19, 1946	Jan. 22, 1946	Feb. 27, 1945
(cents per pound)				
Merchant bars	2.25	2.25	2.25	2.15
Cold-finished bars	2.75	2.75	2.75	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00
Wrought iron bars	4.40	4.40	4.40	4.40

Wire and Wire Products:	Feb. 26, 1946	Feb. 19, 1946	Jan. 22, 1946	Feb. 27, 1945
(cents per pound)				
Bright wire	2.75	2.75	2.75	2.60
Wire nails	2.90	2.90	2.90	2.55

Rails:	Feb. 26, 1946	Feb. 19, 1946	Jan. 22, 1946	Feb. 27, 1945
(dollars per gross ton)				
Heavy rails	\$43.00	\$43.00	\$43.00	\$40.00
Light rails	45.00	45.00	45.00	40.00

Semifinished Steel:	Feb. 26, 1946	Feb. 19, 1946	Jan. 22, 1946	Feb. 27, 1945
(dollars per gross ton)				
Rerolling billets	\$36.00	\$36.00	\$36.00	\$34.00
Sheet bars	36.00	36.00	36.00	34.00
Slabs, rerolling	36.00	36.00	36.00	34.00
Forging billets	42.00	42.00	42.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00

Wire Rods and Skelp:	Feb. 26, 1946	Feb. 19, 1946	Jan. 22, 1946	Feb. 27, 1945
(cents per pound)				
Wire rods	2.15	2.15	2.15	2.00
Skelp	1.90	1.90	1.90	1.90

Pig Iron:	Feb. 26, 1946	Feb. 19, 1946	Jan. 22, 1946	Feb. 27, 1945
(per gross ton)				
No. 2 foundry, Phila.	\$27.59	\$27.59	\$27.59	\$26.84
No. 2, Valley furnace	25.75	25.75	25.75	25.00
No. 2, Southern, Cin'ti.	26.19	26.19	26.19	25.44
No. 2, Birmingham	22.13	22.13	22.13	21.38
No. 2 foundry, Chicago†	25.75	25.75	25.75	25.00
Basic, del'd eastern Pa.	27.09	27.09	27.09	26.34
Basic, Valley furnace	25.25	25.25	25.25	24.50
Malleable, Chicago†	25.75	25.75	25.75	25.00
Malleable, Valley	25.75	25.75	25.75	25.00
L. S. charcoal, Chicago	42.34	42.34	42.34	37.34
Ferromanganese†	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is 60¢ per ton.  
‡ For carlots at seaboard.

Scrap:	Feb. 26, 1946	Feb. 19, 1946	Jan. 22, 1946	Feb. 27, 1945
(per gross ton)				
Heavy melt'g steel, P'gh.	\$20.00	\$20.00	\$20.00	\$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.32	17.32	17.32	17.32
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia	20.00	20.00	20.00	20.00
No. 1 cast, Chicago	20.00	20.00	20.00	20.00

Coke, Connellsville:	Feb. 26, 1946	Feb. 19, 1946	Jan. 22, 1946	Feb. 27, 1945
(per net ton at oven)				
Furnace coke, prompt	\$7.50	\$7.50	\$7.50	\$7.00
Foundry coke, prompt	9.00	9.00	9.00	8.25

Nonferrous Metals:	Feb. 26, 1946	Feb. 19, 1946	Jan. 22, 1946	Feb. 27, 1945
(cents per pound to large buyers)				
Copper, electro., Conn.	12.00	12.00	12.00	12.00
Copper, Lake	12.00	12.00	12.00	12.00
Tin, Straits, New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25
Lead, St. Louis	6.35	6.35	6.35	6.35
Aluminum, virgin, del'd.	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	14.50	14.50	14.50	14.50

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite prices for the current quarter are an estimate based on finished steel shipments for the previous quarter. These figures will be revised when the actual data of shipments for this quarter are compiled.

# Composite Prices . .

FINISHED STEEL				PIG IRON				SCRAP STEEL							
Feb. 26, 1946.....	2.44104¢	per lb.....	.....	\$25.37	per gross ton.....	.....	\$19.17	per gross ton.....	.....	\$19.17	per gross ton.....				
One week ago .....	2.44104¢	per lb.....	.....	\$25.37	per gross ton.....	.....	\$19.17	per gross ton.....	.....	\$19.17	per gross ton.....				
One month ago .....	2.44104¢	per lb.....	.....	\$25.37	per gross ton.....	.....	\$19.17	per gross ton.....	.....	\$19.17	per gross ton.....				
One year ago .....	2.38444¢	per lb.....	.....	\$24.61	per gross ton.....	.....	\$19.17	per gross ton.....	.....	\$19.17	per gross ton.....				
HIGH				LOW				HIGH				LOW			
1945.....	2.44104¢	Oct.	2	2.38444¢	Jan.	2	\$25.37	Oct.	23	\$23.61	Jan.	2	\$19.17	\$19.17	
1944.....	2.30837¢	Sept.	5	2.21189¢	Oct.	5	\$23.61			\$23.61			19.17	\$15.67	
1943.....	2.29176¢			2.29176¢			23.61			23.61			19.17	\$19.17	
1942.....	2.28249¢			2.28249¢			23.61			23.61			19.17	19.17	
1941.....	2.43078¢			2.43078¢			\$23.61	Mar.	20	\$23.45	Jan.	2	\$22.00	\$19.17	
1940.....	2.30467¢	Jan.	2	2.24107¢	Apr.	16	23.45	Dec.	23	22.61	Jan.	2	21.83	16.04	
1939.....	2.35367¢	Jan.	3	2.26689¢	May	16	22.61	Sept.	19	20.61	Sept.	12	22.50	14.08	
1938.....	2.58414¢	Jan.	4	2.27207¢	Oct.	18	23.25	June	21	19.61	July	6	15.00	11.00	
1937.....	2.58414¢	Mar.	9	2.32263¢	Jan.	4	23.25	Mar.	9	20.25	Feb.	16	21.92	12.67	
1936.....	2.32263¢	Dec.	28	2.05200¢	Mar.	10	19.74	Nov.	24	18.73	Aug.	11	17.75	12.67	
1935.....	2.07642¢	Oct.	1	2.06492¢	Jan.	8	18.84	Nov.	5	17.83	May	14	13.42	10.33	
1934.....	2.15367¢	Apr.	24	1.95757¢	Jan.	2	17.90	May	1	16.90	Jan.	27	13.00	9.50	
1933.....	1.95578¢	Oct.	3	1.75836¢	May	2	16.90	Dec.	5	13.56	Jan.	3	12.25	6.75	
1932.....	1.89196¢	July	5	1.83901¢	Mar.	1	14.81	Jan.	5	13.56	Dec.	6	8.50	6.43	
1931.....	1.99626¢	Jan.	13	1.86586¢	Dec.	29	15.90	Jan.	6	14.79	Dec.	15	11.33	8.50	
1930.....	2.25488¢	Jan.	7	1.97319¢	Dec.	9	18.21	Jan.	7	15.90	Dec.	16	15.00	11.25	
1929.....	2.31773¢	May	28	2.26498¢	Oct.	29	18.71	May	14	18.21	Dec.	17	17.58	14.08	

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

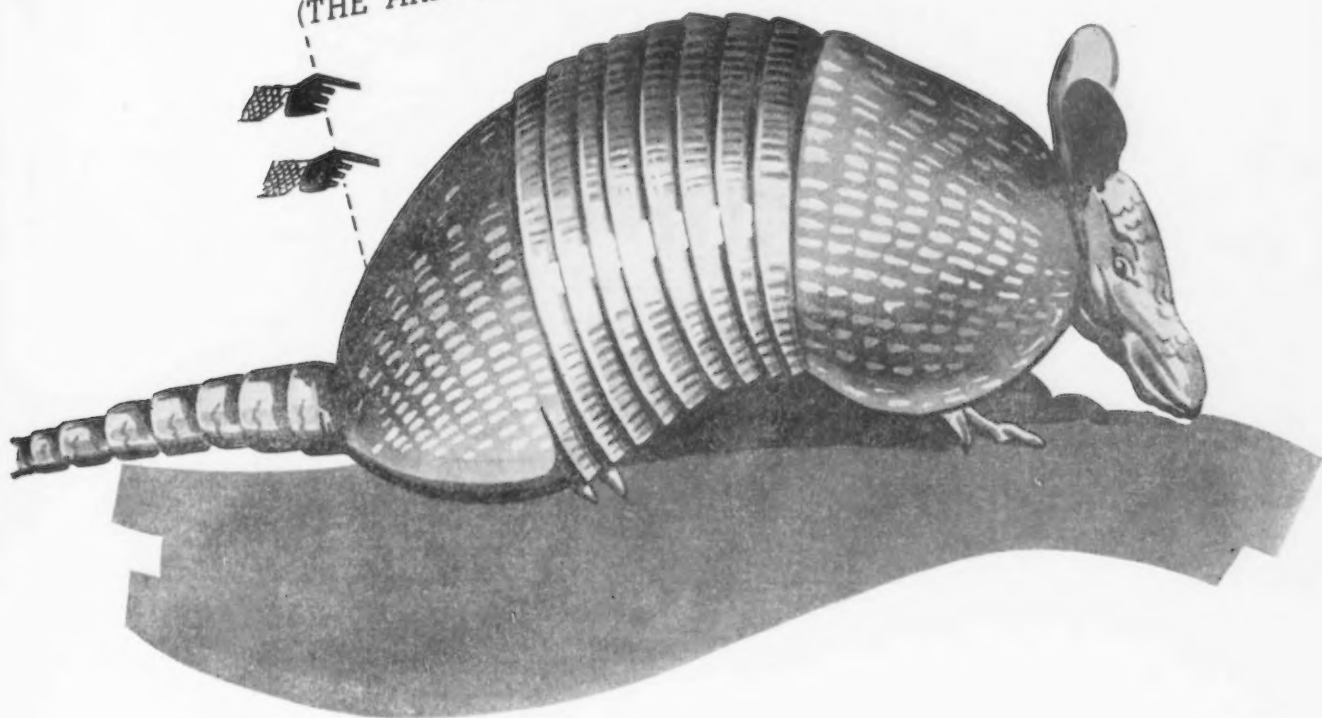
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.



# NATURE'S TANK

(THE ARMADILLO HAS NATURAL PROTECTION)



## *But* INDUSTRY RELIES ON **JESSOP STAINLESS STEEL**

For Protection Against:

OXIDATION • CORROSION • HEAT

The armadillo is well armed with a bony shell, consisting of numerous small plates, for protection against its natural enemies. To guard against the artificial enemies: *oxidation*, *corrosion*, and *heat*, hundreds of industries now depend upon JESSOP Stainless Steels. In many instances special analyses and special heat treating methods have been developed to meet unusually severe specifications. JESSOP Stainless Steels are available in all commercial forms including bars, strip, sheets, plates. Write for literature.

## JESSOP STEEL COMPANY

Head Office and Works:

WASHINGTON, PA.



# Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points, in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 8 pct tax on freight. (1) Mill run sheet, 10¢ per 100 lb under base; primes, 25¢ above base. (2) Unassorted commercial coating. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25¢ per 100 lb to fabricators. (8) Also shafting. For quantities of 20,000 lb. to 39,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is not used. (11) Boxed. (12) This base price for annealed, bright finish wires, commercial spring wire. (13) Produced to dimensional tolerances in AISI Manual Sect. 6. (14) Billets only. (15) 9/32 in. to 47/64 in., 0.15¢. per lb higher.

Basing Points	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cars	10 Pacific Ports, Cars	DELIVERED TO		
													Detroit	New York	Phila- delphia
INGOTS															
Carbon, rerolling															
(\$31.00 f.o.b. mill)															
Carbon, forging	\$36	\$36	\$36	\$36	\$36	\$36	\$36								
Alloy	\$45	\$45				\$45									
(Bethlehem, Massillon, Canton, Coatesville—\$45)															
BILLETS, BLOOMS, SLABS															
Carbon, rerolling	\$36	\$36	\$36	\$36	\$36	\$36	\$36	\$36				\$48 <sup>14</sup>	\$38		
(Provo—\$47.20, Duluth—\$38 <sup>14</sup> )															
Carbon, forging	\$42	\$42	\$42	\$42	\$42	\$42	\$42	\$42				\$54 <sup>14</sup>	\$44		
(Provo—\$53.20, Duluth—\$44 <sup>14</sup> )															
Alloy	\$54	\$54				\$54							\$56		
(Bethlehem, Massillon, Canton—\$54)															
SHEET BARS	\$36	\$36		\$36		\$36	\$36	\$36							
(Canton—\$36)															
PIPE SKELP	1.90¢	1.90¢					1.90¢	1.90¢							
(Coatesville—1.90¢)															
WIRE RODS <sup>15</sup> No. 5 to 9/32 in.	2.15¢	2.15¢		2.15¢	2.15¢							2.40¢	2.65¢		
(Worcester—2.25¢)															
SHEETS															
Hot-rolled	2.20¢	2.20¢	2.20¢	2.20¢	2.20¢	2.20¢	2.20¢	2.20¢	2.30¢	2.20¢		2.75¢	2.30¢	2.44¢	2.37¢
Cold-rolled <sup>1</sup>	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 gage)	3.70¢	3.70¢	3.70¢		3.70¢	3.70¢	3.70¢	3.70¢	3.80¢	3.70¢		4.25¢		3.94¢	3.87¢
Enameling (20 gage)	3.45¢	3.45¢	3.45¢	3.45¢			3.45¢		3.55¢	3.45¢		4.10¢	3.55¢	3.81¢	3.77¢
Long ternes <sup>2</sup>	3.80¢	3.80¢	3.80¢									4.55¢		4.16¢	4.12¢
STRIP															
Hot-rolled <sup>3</sup>	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢	2.46¢	
Cold-rolled <sup>4</sup>	2.80¢	2.90¢		2.80¢			2.80¢						2.90¢	3.16¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.56¢	
Commodity cold-rolled	2.95¢	3.05¢		2.95¢			2.95¢						3.05¢	3.31¢	
(Worcester—3.35¢)															
TINPLATE															
Standard cokes, base box	\$5.00	\$5.00	\$5.00		\$5.10			\$5.10	\$5.10					\$5.354 <sup>11</sup>	\$5.28 <sup>11</sup>
Electro, box															
0.25 lb	\$4.35	\$4.35	\$4.35					\$4.45							
0.50 lb	\$4.50	\$4.50	\$4.50					\$4.60	\$4.60						
0.75 lb	\$4.65		\$4.65					\$4.75	\$4.75						
BLACKPLATE															
29 gage <sup>5</sup>	3.05¢	3.05¢	3.05¢					3.15¢	3.15¢			4.05¢ <sup>11</sup>			3.32¢
TERNES, MFG.															
Special coated, base box	\$4.30	\$4.30	\$4.30					\$4.40	\$4.40						
BARS															
Carbon steel	2.25¢	2.25¢	2.25¢	2.25¢	2.25¢	2.25¢	2.25				2.60¢	2.90¢	2.35¢	2.59¢	2.57¢
(Duluth—2.35¢, Provo, Utah 2.95¢)															
Rail steel <sup>6</sup>	2.25¢	2.25¢	2.25¢	2.25¢	2.25¢	2.25¢					2.60¢	2.90¢			
Reinforcing (billet) <sup>7</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢	2.25¢	2.39¢	
Reinforcing (rail) <sup>7</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.50¢	2.55¢	2.25¢		2.47¢
Cold-finished <sup>8</sup>	2.75¢	2.75¢	2.75¢	2.75¢		2.75¢								3.09¢	3.07¢
(Detroit—2.80¢) (Toledo—2.90¢)															
Alloy, hot-rolled	2.70¢	2.70¢				2.70¢	2.70						2.80¢		
Bethlehem, Massillon, Canton—2.70¢															
Alloy, cold-drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢							3.45¢		
PLATES															
Carbon steel <sup>13</sup>	2.25¢	2.25¢	2.25¢	2.25¢	2.25¢		2.25¢				2.60¢	2.80¢	2.47¢	2.44¢	2.30¢
(Coatesville and Claymont—2.25¢, Provo, Utah 2.95¢)															
Floor plates	3.50¢	3.50¢									3.85¢	4.15¢		3.86¢	3.82¢
Alloy	3.50¢	3.50¢									3.95¢	4.15¢		3.70¢	3.59¢
(Coatesville—3.50¢)															
SHAPES															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢					2.45¢	2.75¢		2.27¢	2.215¢
(Bethlehem—2.10¢)															
SPRING STEEL, C-R															
0.28 to 0.50 carbon	2.80¢			2.80¢											
(Worcester—3.00¢)															
0.51 to 0.75 carbon	4.30¢			4.30¢											
(Worcester—4.50¢)															
0.76 to 1.00 carbon	6.15¢			6.15¢											
(Worcester—6.35¢)															
1.01 to 1.25 carbon	8.35¢			8.35¢											
(Worcester—8.55¢)															
WIRE <sup>9</sup>															
Bright <sup>12</sup>	2.75¢	2.75¢		2.75¢	2.75¢							3.25¢			3.07¢
(Worcester—2.85¢) (Duluth—2.80¢)															
Galvanized															
Add proper size extra and galvanizing extra to Bright Wire base															
Spring (high carbon)	3.35¢	3.35¢		3.35¢								3.85¢			3.67¢
(Worcester—3.45¢)															
PILING															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			2.72¢



# PRICES

## CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

### BASING POINT

	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	21.25	20.40	15.725	16.15	19.125	23.375
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	21.25	20.40	15.725	16.15	19.125	23.375
Billets, P'gh, Chi, Canton, Newark, N. J., Watervliet, Syracuse, Balt.	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Watervliet, Syracuse, Newark, N. J., Ft. Wayne, Titusville	21.25	20.40	15.725	16.15	19.125	23.375
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville	25.00	24.00	18.50	19.00	22.50	27.50
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet	25.00	24.00	18.50	19.00	22.50	27.50
Plates, P'gh, Middletown, Canton	29.00	27.00	21.50	22.00	26.50	30.50
Shapes, structural, P'gh, Chi	25.00	24.00	18.50	19.00	22.50	27.50
Sheets, P'gh, Chi, Middletown, Canton, Balt.	36.00	34.00	28.50	29.00	32.50	38.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	23.50	21.50	17.00	17.50	24.00	35.00
Strip, c-f, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown	30.00	28.00	22.00	22.50	32.00	52.00
Wire, c-r, P'gh, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila.	25.00	24.00	18.50	19.00	22.50	27.50
Wire flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	30.00	28.00	22.00	22.50	32.00	52.00
Rod, h-r, Newark, N. J., Syracuse	25.00	24.00	18.50	19.00	22.50	27.50
Tubing, seamless, P'gh, Chi, Canton, (4 in. to 6 in.)	66.63	66.63	.....	63.30	.....	.....

### SHELL STEEL

	per gross ton
3 in. to 12 in.	\$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00
Basic openhearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.	
Prices delivered Detroit are \$2.00 higher; East Michigan, \$3 higher.	
Price Exceptions: Follansbee Steel Corp. permitted to sell at \$13.00 per gross ton, f.o.b. Toronto, Ohio, above base price of \$52.00.	

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

### ELECTRICAL SHEETS

	per lb
Field grade	3.30¢
Armature	3.65¢
Electrical	4.15¢
Motor	5.05¢
Dynamo	5.75¢
Transformer 72	6.25¢
Transformer 65	7.25¢
Transformer 58	7.75¢
Transformer 52	8.55¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo. Pacific ports add 75¢ per 100 lb on all grades.

### RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb No. 1 O.H., gross ton	\$43.00
Angle splice bars, 100 lb.	2.70
(F.o.b. basing points) per gross ton	
Light rails (from billets)	\$45.00
Light rails (from rail steel)	44.00
base per lb	
Cut spikes	3.25¢
Screw spikes	5.40¢
Tie plate, steel	2.30¢
Tie plates, Pacific Coast	2.45¢
Track bolts	4.75¢
Track bolts, heat treated, to rail-roads	5.00¢
Track bolts, jobbers discount	63.5

Basing points, light rails, Pittsburgh, Chicago, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, Oregon and Washington ports, add 25¢.

### TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk)

	base per lb
High speed	67¢
Straight molybdenum	54¢
Tungsten-molybdenum	57 1/2¢
High-carbon-chromium*	43¢
Oil hardening*	24¢
Special carbon*	22¢
Extra carbon*	18¢
Regular carbon*	14¢
Warehouse prices east of Mississippi are 2¢ per lb higher; west of Mississippi 3¢ higher.	

### CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Pa.	18.00*	19.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	18.00	.....
Inconel-clad		
10 pct, f.o.b. Coatesville..	25.00	.....
Monel-clad		
10 pct, f.o.b. Coatesville..	24.00	.....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	9.00	.....

\*Includes annealing and pickling.

### WIRE PRODUCTS

To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Basing Points	Pacific Coast Basing Points†
base per keg		
Standard wire nails...	\$2.90	\$3.40
Coated nails	2.90	3.40
Cut nails, carloads	3.85	.....
base per 100 lb		
Annealed fence wire	\$3.20	\$3.70
Annealed galv. fence wire	3.55	4.05
base column		
Woven wire fence*	67	85
Fence posts, carloads..	69	86
Single loop bale ties..	66	91
Galvanized barbed wire**	72	82
Twisted barless wire..	72	.....

\*15 1/2 gage and heavier. \*\*On 80-rod spools in carload quantities.

†Prices subject to switching or transportation charges.

### ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	\$6.00	\$12.00
15-lb coating I.C.	7.00	14.00
20-lb coating I.C.	7.50	15.00

### ALLOY EXTRAS

Alloy Steel	Basic Openhearth		Electric Furnace	
	Bars and Bar-strip	Billets, Blooms and Slabs	Bars and Bar-strip	Billets, Blooms, and Slabs
NE 8600	0.65¢	\$13.00	\$1.15	\$23.00
NE 8700	0.70	14.00	1.20	24.00
NE 9400	0.75	15.00	1.25	25.00
NE 9700	0.65	13.00	1.15	23.00
NE 9800	1.30	28.00	1.80	36.00
NE 9900	1.20	24.00	1.55	31.00

The extras shown are in addition to the base price of \$2.70 per 100 lb on finished products and \$54 per gross ton on semifinished steel, major basing points, as shown in table, opposite page, and are in cents per pound when applicable to bars and bar-strip and in dollars per gross ton when applicable to billets, blooms and slabs. When acid openhearth is specified and acceptable, add to basic openhearth alloy differential 0.25¢ per lb for bars and bar-strip and \$5 per gross ton for billets, blooms and slabs.

## PRICES

### WELDED PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh district and Lorain, Ohio, mills  
(F.o.b. Pittsburgh only on wrought pipe)  
base price—\$200.00 per net ton

#### Steel (buttweld)

	Black	Galv.
1/2-in. ....	63 1/2	51
3/4-in. ....	66 1/2	55
1-in. to 3-in. ....	68 1/2	57 1/2

#### Wrought Iron (buttweld)

1/2-in. ....	24	3 1/2
3/4-in. ....	30	10
1-in. and 1 1/4-in. ....	34	16
1 1/2-in. ....	38	18 1/2
2-in. ....	37 1/2	18

#### Steel (lapweld)

2-in. ....	61	49 1/2
2 1/2-in. and 3-in. ....	64	52 1/2
3 1/2-in. to 6-in. ....	66	54 1/2

#### Wrought Iron (lapweld)

2-in. ....	30 1/2	12
2 1/2-in. to 3 1/2-in. ....	31 1/2	14 1/2
4-in. ....	33 1/2	18
4 1/2-in. to 8-in. ....	32 1/2	17

#### Steel (butt, extra strong, plain ends)

1/2-in. ....	61 1/2	50 1/2
3/4-in. ....	65 1/2	54 1/2
1-in. to 3-in. ....	67	57

#### Wrought Iron (same as above)

1/2-in. ....	25	6
3/4-in. ....	31	12
1-in. to 2-in. ....	38	19 1/2

#### Steel (lap, extra strong, plain ends)

2-in. ....	59	48 1/2
2 1/2-in. and 3-in. ....	63	52 1/2
3 1/2-in. to 6-in. ....	66 1/2	56

#### Wrought Iron (same as above)

2-in. ....	33 1/2	15 1/2
2 1/2-in. to 4-in. ....	39	22 1/2
4 1/2-in. to 6-in. ....	37 1/2	21

On buttweld and lapweld steel pipe jobbers are granted a discount of 5 pct. On l.c.l. shipments prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lapweld and one point lower discount, or \$2 a ton higher on all buttweld.

### BOILER TUBES

Seamless steel and lapweld commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft f.o.b. Pittsburgh, in carload lots

	Seamless	Lapweld, Cold-Drawn	Hot-Rolled
2 in. O.D. 13 B.W.G. ....	15.03	13.04	12.38
2 1/2 in. O.D. 12 B.W.G. ....	20.21	17.54	16.58
3 in. O.D. 12 B.W.G. ....	22.48	19.50	18.35
3 1/2 in. O.D. 11 B.W.G. ....	28.37	24.62	23.15
4 in. O.D. 10 B.W.G. ....	35.20	30.54	28.66

(Extras for less carload quantities)

40,000 lb or ft and over. ....	Base
30,000 lb or ft to 39,999 lb or ft. ....	5 pct
20,000 lb or ft to 29,999 lb or ft. ....	10 pct
10,000 lb or ft to 19,999 lb or ft. ....	20 pct
5,000 lb or ft to 9,999 lb or ft. ....	30 pct
2,000 lb or ft or 4,999 lb or ft. ....	45 pct
Under 2,000 lb or ft. ....	65 pct

### CAST IRON WATER PIPE

Per Net Ton

6-in. and larger, del'd Chicago. ....	\$60.80
6-in. and larger, del'd New York. ....	60.20
6-in. and larger, Birmingham. ....	52.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles or Seattle 74.00	
For all rail shipment; rail and water shipment less.	
Class "A" and gas pipe, \$3 extra; 4-in. pipe is \$5 a ton above 6-in.	

### BOLTS, NUTS, RIVETS, SET SCREWS

#### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

#### Machine and Carriage Bolts

Base discount less case lots

	Percent Off List
1/2 in. & smaller x 6 in. & shorter. ....	65 1/2
9/16 & 5/8 in. x 6 in. & shorter. ....	63 1/2
3/4 to 1 in. x 6 in. & shorter. ....	61
1 1/4 in. and larger, all lengths. ....	59
All diameters over 6 in. long. ....	59
Lag. all sizes. ....	62
Plow bolts. ....	65

#### Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

1/2 in. and smaller. ....	62
1/2 in. and smaller, inclusive. ....	59
1 1/4 to 1 1/2 in. inclusive. ....	57
1 1/2 in. and larger. ....	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

#### Semifin. Hexagon Nuts U.S.S. S.A.E.

Base discount less keg lots

7/16 in. and smaller. ....	64
1/2 in. and smaller. ....	62
1/2 in. through 1 in. ....	60
9/16 in. through 1 in. ....	59
1 1/4 in. through 1 1/2 in. ....	57
1 1/2 in. and larger. ....	56

In full keg lots, 10 pct additional discount.

#### Stove Bolts

	Consumer
Packages, nuts loose. ....	71 and 10
In packages. ....	71
In bulk. ....	80
On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.	

#### Large Rivets

(1/2 in. and larger)

Base per 100 Lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham. .... \$3.75

#### Small Rivets

(7/16 in. and smaller)

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham. .... 65 and 5

#### Cap and Set Screws Consumer Percent Off List

Upset full fin, hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in. ....	64
Upset set screws, cup and oval points 71	
Milled studs. ....	46
Flat head cap screws, listed sizes. ....	36
Fillister head cap, listed sizes. ....	51
Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.	

### FLUORSPAR

Maximum price f.o.b. consumer's plant, \$30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

#### Exception

When the WPB Steel Div. certifies in writing the consumers need for one of the higher grades of metallurgical fluor spar specified in the table below the price shall be taken from the table plus items (1 and 2) from paragraph above.

Effective CaF <sub>2</sub> Content:	Base price per short ton
70% or more. ....	\$33.00
65% but less than 70%. ....	32.00
60% but less than 65%. ....	31.00
Less than 60%. ....	30.00

### METAL POWDERS

Prices are based on current market prices of ingots plus a fixed figure. F.o.b. shipping point, cents per lb, ton lots.  
Copper, electrolytic, 150 and 200 mesh. .... 21 1/2¢ to 23 1/2¢

Copper, reduced, 150 and 200 mesh. ....	20 1/2¢ to 25 1/2¢
Iron, commercial, 100 and 200 mesh 96 + % Fe. ....	12 1/2¢ to 15¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots. ....	4¢
Iron, hydrogen reduced, 300 mesh and finer, 98 1/2 + % Fe, drum lots. ....	63¢
Iron, electrolytic, unannealed, 300 mesh and coarser, 99 + % Fe 30 to 33¢	
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe. ....	42¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe. ....	90¢
Aluminum, 100 and 200 mesh. ....	25¢
Antimony, 100 mesh. ....	30¢
Cadmium, 100 mesh. ....	\$1.40
Chromium, 100 mesh and finer. ....	\$1.25
Lead, 100, 200 & 300 mesh. ....	11 1/2 to 15¢
Manganese. ....	65¢
Nickel, 150 mesh. ....	51 1/2¢
Solder powder, 100 mesh. 8 1/2¢ plus metal	
Tin, 100 mesh. ....	58 1/2¢
Tungsten metal powder, 98%-99%, any quantity, per lb. ....	\$2.60
Molybdenum powder, 99%, in 200-lb kegs, f.o.b. York, Pa., per lb. ....	\$2.60
Under 100 lb. ....	\$3.00

\*Freight allowed east of Mississippi.

### COKE

Furnace, beehive (f.o.b. oven) Net Ton  
Connellsville, Pa. .... \$7.50\*

Foundry, beehive (f.o.b. oven)  
Fayette Co., W. Va. .... 8.10  
Connellsville, Pa. .... 9.00

Foundry, Byproduct	
Chicago, del'd. ....	13.75
Chicago, f.o.b. ....	13.00
New England, del'd. ....	14.65
Kearny, N. J., f.o.b. ....	13.05
Philadelphia, del'd. ....	13.28
Buffalo, del'd. ....	13.40
Portsmouth, Ohio, f.o.b. ....	11.50
Painesville, Ohio, f.o.b. ....	12.15
Erie, del'd. ....	13.15
Cleveland, del'd. ....	13.20
Cincinnati, del'd. ....	13.25
St. Louis, del'd. ....	13.75†
Birmingham, del'd. ....	10.90

\*Hand drawn ovens using trucked coal permitted to charge \$8.60 per ton plus transportation charges.

†Except producers situated in states other than Missouri, Alabama or Tennessee, sellers may charge a maximum delivered price of \$14.25 in the St. Louis, Mo., and East St. Louis, Ill., switching districts.

### REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	Per 1000
Super-Duty brick, St. Louis. ....	\$68.50
First quality, Pa., Md., Ky., Mo., Ill. ....	54.40
First quality, New Jersey. ....	59.35
Sec. quality, Pa., Md., Ky., Mo., Ill. ....	49.35
Sec. quality, New Jersey. ....	51.95
No. 1 Ohio. ....	45.60
Ground fire clay, net ton. ....	8.05

Silica Brick  
Pennsylvania and Birmingham. .... \$54.40  
Chicago District. .... 62.45  
Silica cement, net ton (Eastern). .... 9.55

Chrome Brick Per Net Ton  
Standard chemically bonded, Balt., Plymouth Meeting, Chester. .... \$54.00

Magnesite Brick  
Standard, Balt. and Chester. .... \$76.00  
Chemically bonded, Baltimore. .... 65.00

Grain Magnesite  
Domestic, f.o.b. Balt. and Chester in sacks (carloads). .... \$43.48  
Domestic, f.o.b. Chewelah, Wash. in bulk. .... 22.00  
in sacks. .... 26.00

### LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports\*)

	Per Gross Ton
Old range, bessemer, 51.50. ....	\$4.95
Old range, non-bessemer, 51.50. ....	4.80
Mesaba, bessemer, 51.50. ....	4.70
Mesaba, non-bessemer, 51.50. ....	4.55
High phosphorus, 51.50. ....	4.35

\*Adjustments are made to indicate prices based on variance of Fe content of ores as analyzed on a dry basis by independent laboratories.



# PRICES

## WAREHOUSE PRICES

Delivered metropolitan areas per 100 lb. These are zoned warehouse prices in conformance with latest zoning amendment to OPA Price Schedule 49.

Cities	SHEETS			STRIP		Plates 1/4 in. and heavier	Structural Shapes	BARS		ALLOY BARS			
	Hot Rolled (10 gage)	Cold Rolled	Galvanized (24 gage)	Hot Rolled	Cold Rolled			Hot Rolled	Cold Finished	Hot Rolled, NE 8617-20	Hot Rolled, NE 9442-45 Ann.	Cold Drawn, NE 8617-20	Cold Drawn, NE 9442-45 Ann.
Philadelphia	\$3.518	\$4.872	\$4.888	\$3.922	\$4.772	\$3.605	\$3.668	\$3.922	\$4.172	\$5.818	\$6.866	\$7.072	\$8.172
New York	3.59	4.813	5.210	3.974	4.772	3.768	3.758	3.853	4.203	5.858	6.908	7.103	8.203
Boston	3.744	4.744	5.324	4.106	4.715	3.912	3.912	4.044	4.244	6.012	7.062	7.194	8.394
Baltimore	3.394	4.852	4.994	3.902	4.752	3.594	3.758	3.902	4.152				
Norfolk	3.771	4.985	5.471	4.185	4.885	3.971	4.002	4.085	4.265				
Chicago	3.25	4.26	5.331	3.60	4.851	3.55	3.55	3.50	3.85	5.60	6.85	6.85	7.75
Milwaukee	3.387	4.337	5.372	3.737	4.787	3.687	3.687	3.637	3.987	5.837	6.887	6.887	8.137
Cleveland	3.35	4.40	4.977	3.60	4.451	3.40	3.588	3.35	3.85	5.60	6.85	6.85	7.75
Buffalo	3.35	4.40	4.85	3.619	4.689	3.63	3.40	3.35	3.85	5.60	6.85	6.85	7.75
Detroit	3.45	4.50	5.10	3.70	4.659	3.609	3.681	3.45	3.90	5.93	6.98	6.98	8.059
Cincinnati	3.425	4.475	4.925	3.675	4.711	3.661	3.691	3.611	4.111	5.95	7.00	7.011	8.261
St. Louis	3.397	4.347	5.231	3.747	4.931	3.697	3.697	3.647	4.131	5.981	7.031	7.031	8.131
Pittsburgh	3.35	4.40	4.85	3.60	4.45	3.40	3.40	3.35	3.85	5.60	6.85	6.85	7.75
St. Paul	3.50	4.46	5.357	3.88	5.102	3.813	3.813	3.763	3.481	5.94	5.99	7.361	8.461
Omaha	3.885	5.443	5.615	4.143		4.093	4.093	4.043	4.543				
Indianapolis	3.52	4.568	5.018	3.768	4.741	3.63	3.63	3.58	4.08	5.93	6.98	6.98	8.23
Birmingham	3.45		4.85	3.70		3.55	3.55	3.50	4.53				
Memphis	3.965	4.78	5.365	4.215		4.065	4.065	4.015	4.33				
New Orleans	4.058	5.079	5.458	4.308		4.158	4.158	4.108	4.729				
Houston	3.763	5.573	6.413	4.313		4.25	4.25	3.75	6.473	7.223	8.323	8.323	9.373
Los Angeles	5.00	7.20	6.20	4.95	5.613	4.95	4.85	4.40	5.683	8.204	9.404	9.304	10.454
San Francisco	4.581	7.304	6.45	4.504	7.333	4.851	4.351	4.151	5.433	8.304	9.404	9.404	10.454
Seattle	4.651	7.054	6.05	4.251		4.751	4.451	4.351	5.783		9.404		
Portland	4.651	6.804	5.85	4.751		4.751	4.451	4.451	5.833	8.304	9.404	8.304	9.404
Salt Lake City	4.530		6.271	5.531		4.981	4.981	4.881	6.00				

## BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-FINISHED: Sheets, 400 to 1499 lb; strip, extras on all quantities; bars, 1500 lb base.

GALVANIZED: 450 to 1499 lb.

NE ALLOY BARS: 1000 to 39,999 lb.

EXCEPTIONS: (1) 150 to 499 lb. (2) 150 to 1499 lb. (3) 400 to 1499 lb. (4) 450 to 1499 lb. (5) 500 to 1499 lb. (6) 0 to 199 lb. (7) 400 to 1499 lb. (8) 1000 to 1999 lb. (9) 450 to 3749 lb. (10) 400 to 3999 lb. (11) 300 to 4999 lb. (12) 300 to 10,000 lb. (13) 400 to 14,999 lb. (14) 400 lb and over. (15) 1000 lb and over. (16) 1500 lb and over. (17) 2000 lb and over. (18) 3500 lb and over.

(\*) Philadelphia: Galvanized sheet, 25 or more bundles.

Extra for size, quality, etc., apply on above quotations.

\*Add 0.271¢ for sizes not rolled in Birmingham.

\*\*City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

## PIG IRON PRICES

Maximum per gross ton, established by OPA Oct. 22, 1945. Prices do not reflect 3 pct tax on freight.

BASING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	\$26.25	\$26.75	\$27.25	\$27.75		Boston	Everett	\$ .50	\$26.75	\$27.25	\$27.75	\$28.25	
Birdsboro	26.25	26.75	27.25	27.75	\$31.25	Boston	Birdsboro-Steelton	4.02					\$35.27
Birmingham	20.75	22.13		26.75		Brooklyn	Bethlehem	2.50	28.75	29.25	29.75	30.25	
Buffalo	24.75	25.75	26.25	26.75	31.25	Brooklyn	Birdsboro	2.92					34.17
Chicago	25.25	25.75	25.75	26.25		Canton	Clev. Ygstin, Sharpsvil.	1.39	26.64	27.14	27.14	27.64	
Cleveland	25.25	25.75	25.75	26.25		Canton	Buffalo	3.19					34.44
Detroit	25.25	25.75	25.75	26.25		Cincinnati	Birmingham	4.06	24.81	26.19			
Duluth	25.75	26.25	26.25	26.75		Cincinnati	Hamilton	1.11			26.86		
Erie	25.25	25.75	26.25	26.75		Cincinnati	Buffalo	4.40					35.65
Everett	26.25	26.75	27.25	27.75		Jersey City	Bethlehem	1.53	27.78	28.28	28.78	29.28	
Granite City	25.25	25.75	25.75	26.25		Jersey City	Birdsboro	1.94					33.19
Hamilton	25.25	25.75	25.75	26.25		Los Angeles	Provo	4.95	28.20	28.70			
Neville Island	25.25	25.75	25.75	26.25		Los Angeles	Buffalo	15.41					46.66
Provo	23.25	23.75				Mansfield	Cleveland & Toledo	1.94	27.19	27.69	27.69	28.19	
Sharpville 1	25.25	25.75	25.75	26.25		Mansfield	Buffalo	3.38					34.61
Sparrows Point	26.25	26.75				Philadelphia	Swedeland	.84	27.09	27.59	28.09	28.59	
Steelton	26.25				31.25	Philadelphia	Birdsboro	1.24					32.49
Swedeland	26.25	26.75	27.25	27.75		San Francisco	Provo	4.95	28.20	28.70			
Toledo	25.25	25.75	25.75	26.25		San Francisco	Buffalo	15.41					46.66
Youngstown	25.25	25.75	25.75	26.25		Seattle	Provo	4.95	28.20	28.70			
						Seattle	Buffalo	15.41					46.66
						St. Louis	Granite City	.50	25.75	26.25	26.25	26.75	
						St. Louis	Buffalo	7.07					38.32

(1) Struthers Iron & Steel Co., Struthers, Ohio, may charge 50¢ per ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Charcoal pig iron base prices for Lyles, Tenn., and Lake Superior furnaces, \$33.00 and \$34.00, respectively. Newberry Brand of Lake Superior charcoal iron \$39.00 per g.t., f.o.b. furnace, by order L 39 to RPS 10. Apr. 11, 1945, retroactive to Mar. 7, 1945. Delivered to Chicago, \$42.34. High phosphorus

iron sells at Lyles, Tenn., at \$28.50.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorous content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. Effective Mar. 3, 1943, \$2 per ton extra

may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron and bessemer ferrosilicon up to and including 14.00 pct silicon covered by RPS 10 as amended. Silvery iron, silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—\$31.25; f.o.b. Buffalo—\$32.50. Add \$1.00 per ton for each additional 0.50 pct Si. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for prices of comparable analysis.

# FERROALLOY PRICES

## Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.  
 Carload lots (bulk) ..... \$135.00  
 Less ton lots (packed) ..... 148.50  
 F.o.b. Pittsburgh ..... 139.50  
 \$1.70 for each 1% above 82% Mn; penalty, \$1.70 for each 1% below 78%.  
 Briquets—per pound of briquet, freight allowed, 66% contained Mn.  
 Eastern Central Western  
 Carload, bulk .. 6.05¢ 6.30¢ 6.60¢  
 Ton lots ..... 6.65¢ 7.55¢ 8.55¢  
 Less ton lots.... 6.80¢ 7.80¢ 8.80¢

## Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.  
 16-19% Mn 19-21% Mn  
 3% max. Si 3% max. Si  
 Carloads ..... \$35.00 \$36.00  
 Less ton ..... 47.50 48.50  
 F.o.b. Pittsburgh, Chicago ..... 40.00

## Manganese Metal

Contract basis, lump size, per pound of metal, f.o.b. shipping point, freight allowed.  
 96-98% Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.  
 Carload, bulk ..... 30¢  
 L.c.l. lots ..... 32¢

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.  
 Carloads ..... 34¢  
 Ton lots ..... 36¢  
 Less ton lots ..... 38¢

## Low-Carbon Ferromanganese

Contract price per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.  
 Carloads Ton Less  
 0.06% C, 0.06% P, 90% Mn ..... 23.00¢ 23.40¢ 23.65¢  
 0.10% max. C, 1% or 2% max. Si... 23.00¢ 23.40¢ 23.65¢  
 0.15% max. C, 1% or 2% max. Si... 22.00¢ 22.40¢ 22.65¢  
 0.30% max. C, 1% or 2% max. Si... 21.00¢ 21.40¢ 21.65¢  
 0.50% max. C, 1% or 2% max. Si... 20.00¢ 20.40¢ 20.65¢  
 0.75% max. C, 7.00% max. Si... 16.00¢ 16.40¢ 16.65¢

## Silicomanganese

Contract basis, lump size, per pound of metal, f.o.b. shipping point, freight allowed. 65-70% Mn, 17-20% Si, 1.5% max. C.  
 Carload, bulk ..... 6.05¢  
 Ton lots ..... 6.70¢  
 Briquet, contract basis, carlots, bulk, freight allowed, per lb. of briquet ..... 5.80¢  
 Ton lots ..... 6.30¢  
 Less ton lots ..... 6.55¢

## Silvery Iron (electric furnace)

Si 14.01 to 14.50%, \$45.50 per G. T. f.o.b. Jackson, Ohio; \$48.75 f.o.b. Keokuk, Iowa; \$46.75 f.o.b. Niagara Falls. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%. Covered by MPR 405.

## Silicon Metal

Contract price per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots, packed.  
 Eastern Central Western  
 96% Si, 2% Fe.. 13.10¢ 13.55¢ 16.50¢  
 97% Si, 1% Fe.. 13.45¢ 13.90¢ 16.80¢

## Ferrosilicon Briquets

Contract price per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination. 40% Si.  
 Eastern Central Western  
 Carload, bulk .. 3.35¢ 3.50¢ 3.65¢  
 Ton lots ..... 3.80¢ 4.20¢ 4.25¢

## Electric Ferrosilicon

Contract price per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.  
 Eastern Central Western  
 50% Si ..... 6.65¢ 7.10¢ 7.25¢  
 75% Si ..... 8.05¢ 8.20¢ 8.75¢  
 80-90% Si ..... 8.90¢ 9.05¢ 9.55¢  
 90-95% Si .. 11.05¢ 11.20¢ 11.65¢

## Ferrochrome

(65-72% Cr, 2% max. Si)  
 Contract prices per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.  
 Eastern Central Western  
 0.06% C ..... 23.00¢ 23.40¢ 24.00¢  
 0.10% C ..... 22.50¢ 22.90¢ 23.50¢  
 0.15% C ..... 22.00¢ 22.40¢ 23.00¢  
 0.20% C ..... 21.50¢ 21.90¢ 22.50¢  
 0.50% C ..... 21.00¢ 21.40¢ 22.00¢  
 1.00% C ..... 20.50¢ 20.90¢ 21.50¢  
 2.00% C ..... 19.50¢ 19.90¢ 20.50¢  
 66-71% Cr, 4-10% C ... 13.00¢ 13.40¢ 14.00¢  
 62-66% Cr, 5-7% C .... 13.50¢ 13.90¢ 14.50¢

Briquets—contract price per pound of briquet, f.o.b. shipping point, freight allowed. 60% chromium.  
 Eastern Central Western  
 Carload, bulk .. 8.25¢ 8.55¢ 8.95¢  
 Ton lots ..... 8.75¢ 9.25¢ 10.75¢  
 Less ton lots... 9.00¢ 9.50¢ 11.00¢

## High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low-carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N. High-carbon type: 66-71% Cr, 4-5% C, 0.75% N. Add 5¢ per lb to regular high-carbon ferrochrome price schedule.

## S. M. Ferrochrome

Contract price per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.  
 High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.  
 Eastern Central Western  
 Carload ..... 14.00 14.40 15.00  
 Ton lots ..... 14.90 15.55 16.75  
 Less ton lots .. 15.40 16.05 17.25  
 Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25 max. C.  
 Eastern Central Western  
 Carload ..... 20.00 20.40 21.00  
 Ton lots ..... 21.00 21.65 22.85  
 Less ton lots .. 22.00 22.65 23.85

## Chromium Metal

Contract prices per pound, chromium contained, carload, f.o.b. shipping point, freight allowed. 97% min. Cr, 1% max. Fe.  
 Eastern Central Western  
 0.20% max. C.. 83.50 85.00 86.25  
 0.50% max. C.. 79.50 81.00 82.25  
 9.00% min. C.. 79.50 81.00 82.25

## Chromium—Copper

Contract price per pound of alloy, f.o.b. Niagara Falls, freight allowed east of the Mississippi. 8-11% Cr, 88-90% Cu, 1.00% max. Fe, 0.50% max. Si.  
 Shot or ingot ..... 45¢

## Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.  
 30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.  
 Eastern Central Western  
 Carloads ..... 13.00 13.50 15.55  
 Ton lots ..... 14.50 15.25 17.40  
 Less ton lots... 15.50 16.25 18.40

## Calcium—Manganese—Silicon

Contract prices per pound of alloy, lump, f.o.b. shipping point, freight allowed.  
 16-20% Ca, 14-18% Mn, 53-59% Si.  
 Eastern Central Western  
 Carloads ..... 15.50¢ 16.00¢ 18.05¢  
 Ton lots ..... 16.50¢ 17.35¢ 19.10¢  
 Less ton lots... 17.00¢ 17.35¢ 19.60¢

## Calcium Metal

Eastern zone contract prices per pound of metal, f.o.b. shipping point, freight allowed. Add 0.9¢ for central zone; 0.49¢ for western zone.  
 Cast Turnings Distilled  
 Ton lots ..... \$1.35 \$1.75 \$4.25  
 Less ton lots... 1.60 2.00 5.00

## Other Ferroalloys

Ferrotungsten, standard, lump or ¼X down, packed, f.o.b. plant  
 Niagara Falls, Washington, Pa., York, Pa., per pound contained T, 5 ton lots, freight allowed .. \$1.88  
 Ferrovandium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V...  
 Openhearth ..... \$2.70  
 Crucible ..... \$2.80  
 High speed steel (Primos) .. \$2.90  
 Vanadium pentoxide, 88-92% V<sub>2</sub>O<sub>5</sub>, technical grade, contract basis, per pound contained V<sub>2</sub>O<sub>5</sub> \$1.10  
 Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti \$1.23  
 Less ton lots ..... \$1.25  
 Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti ..... \$1.35  
 Less ton lots ..... \$1.40  
 High-carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads ..... \$142.50  
 Ferrophosphorus, 18%, electric or blast furnaces, f.o.b. Anniston, Ala., carlots, with \$3 unitage freight equalled with Rockdale, Tenn., per gross ton ..... \$58.50  
 Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., \$3 unitage freight equalled with Nashville, per gross ton ..... \$75.00  
 Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo ..... 95¢  
 Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo ..... 80¢  
 Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo ..... 80¢  
 Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo ..... 80¢  
 Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy ..... 14¢  
 Carload lots ..... 4.60¢  
 Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy ..... 4.60¢  
 Carload, bulk ..... 5.75¢  
 Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload ..... 7.25¢  
 Ton lots .....  
 Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Phillo, Ohio, freight allowed, per pound. Car lots ..... 8.00¢  
 Ton lots ..... 8.75¢  
 Less ton lots ..... 9.25¢

## Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.  
 Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.  
 Eastern Central Western  
 Less ton lots.. \$1.30 \$1.3075 \$1.329  
 Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.  
 Ton lots ..... \$1.89 \$1.903 \$1.935  
 Less ton lots... 2.01 2.023 2.055

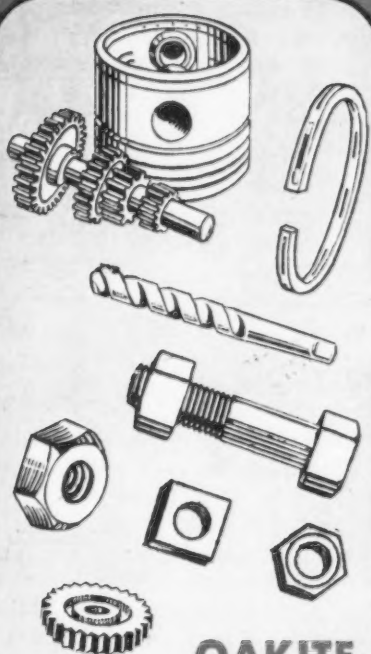
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.  
 Less ton lots \$2.10 \$2.1125 \$2.1445

Silicaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy.  
 Carload lots ..... 25¢  
 Ton lots ..... 26¢  
 Silvaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy.  
 Carload lots ..... 58¢  
 Ton lots ..... 59¢  
 Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.  
 No. 1 ..... 37.5¢  
 No. 6 ..... 60¢  
 No. 79 ..... 45¢  
 Bortram, f.o.b. Niagara Falls  
 Ton lots, per pound ..... 45¢  
 Less ton lots, per pound..... 50¢  
 Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb. \$2.25  
 Ton lots ..... \$2.30  
 Less ton lots ..



***STOP RUST!* on parts between operations or in storage by using**

# OAKITE SPECIAL PROTECTIVE OIL



## OAKITE PROTECTIVE OIL

may be used on a wide variety of work or parts, its moisture-repelling and rust-preventing properties being particularly advantageous on:

- Screw Machine Parts
- Stamped and Formed Parts
- Bolts   Nuts   Gears   Taps
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- Reamers   Knurling Tools
- Hobs   Chucks   Forgings
- Flat Steel Specialties
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- Saw Blades

**R**UST on ferrous parts is a plague and trouble maker. You find it constantly occurring on surfaces after machining, grinding, tumbling, sandblasting, brazing, metal cleaning and other operations because of atmospheric conditions, acid fumes and fingermarks. Rust causes rejects, curtails output. It unnecessarily adds to unit cost because extra time, extra work and materials are expended in its removal.

If you have trouble from rust on work or parts in process, or on parts or tools in storage, try this quick, inexpensive way to combat and prevent it. Simply apply Oakite Special Protective Oil at full concentration or in dilution according to directions. A thin, transparent, moisture-repelling and resistant film forms on ferrous surfaces and successfully stops rust formation.

### This **FREE** Booklet Gives Details

It describes various methods of applying Oakite Special Protective Oil; concentration to use; gives case histories on its advantages and economies in different manufacturing industries. Your copy is **FREE** for the asking. Send for it today because it can provide the **LOW-COST** answer to your rust prevention problem.



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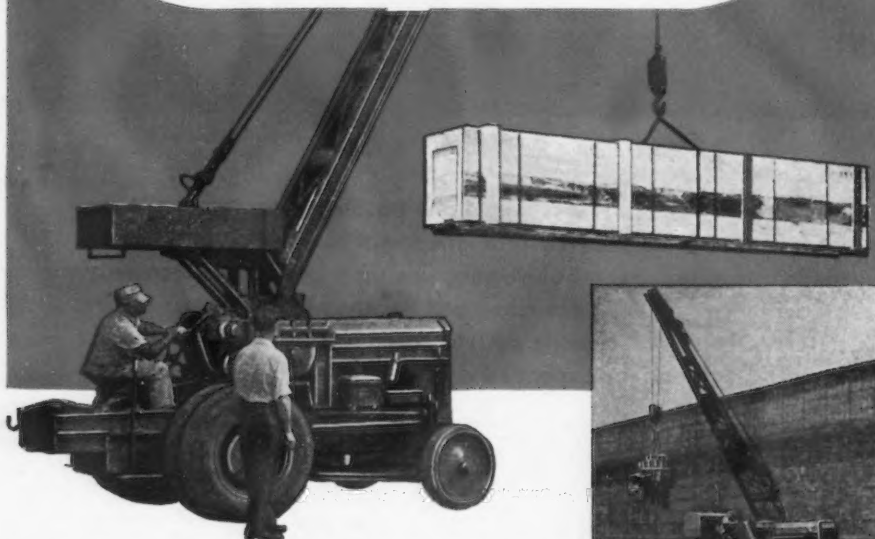
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Big Stuff Off and On Trucks, Freight Cars • Moving Large Machines and Parts • Handling Bales, Boxes, Drums • Moving Big Castings, Motors, Railroad and Marine Gear • Loading Air Transport Planes Handling Tanks, Pipe, Structural Steel, Rails, Timber Installing Heavy Valves, Fittings . . . and lots more!



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Roustabout users in hundreds of different industries have found this modern load-hustler far more useful than they expected. For it goes everywhere — up, down, in and out — keeps things moving, prevents delays, meets emergencies without taking crews from other work. It handles any load to 7½ tons, is built for years of overwork — all gears run in oil, ball-bearing boom turntable, full-swing boom, smart operation. Your Roustabout Crane quickly pays for itself by faster load-handling and lower-costs. Full facts without obligation — write today!

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## Fluorspar Reserves In Illinois Gravelly Affected During War

Chicago

• • • Illinois fluorspar reserves were seriously affected by stepped up wartime mining activities, according to Dr. M. M. Leighton, chief of the Illinois State Geological Survey.

"Deposits, as now known, will not last more than a few decades," Dr. Leighton reported.

He stated that average annual production of fluorspar from 1940 to 1944 was 155,000 tons compared with 63,000 tons for the years 1935 to 1939, an increase of 146 pct.

The state survey had geologists in the field throughout the war making a new study of fluorspar districts. Geological studies are being assembled for publication for release to the industry and the geological and mining professions.

In another section of his report, Dr. Leighton said that, although there is an abundance of coal, the number of mines will be considerably reduced within the next 25 yr. Remaining operations will produce about the same quantity of coal as at present, he predicted. Strip mining will decline considerably, even though it may be found possible to strip to greater depth than the present 60 to 65 ft, he said. This would make shaft mines responsible for an additional 10 to 15 million tons if total production is to be maintained.

While zinc and lead production increased during the war, additional reserves were developed. Silica, mined for the glass and foundry industries in the Ottawa, Ill., district, is abundant, as is limestone and dolomite, the report stated.

Reporting on petroleum, Dr. Leighton pointed out that Illinois' second oil development which began in 1936 and reached its peak in 1940 with an annual production of 147 million barrels, declined to 74 million barrels, or about one half, in 1945. The rate of decline, however, has leveled off and it is expected by the survey that the decline will be more gradual than heretofore. Proven reserves as of Jan. 1, 1946, are estimated at 333 million barrels.



MEMORANDUM TO:

*Designing engineers  
planning new and  
better products . . .*

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**GLOBE MECHANICAL  
TUBING**

for *Strength*  
*Minimum Weight*  
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**G**LOBE SEAMLESS MECHANICAL TUBING, hot and cold drawn, is available in sizes, shapes, and wall thickness to meet a wide range of requirements.

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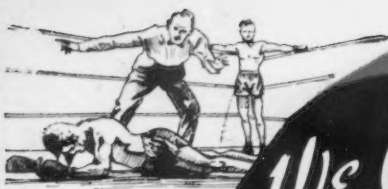
It is an ideal material for load-bearing structural members and parts where strength with a minimum of weight is needed. Its economy for the manufacture of many machine parts is universally recognized.

Globe engineers are at your service to assist in the selection of tubing of the exact characteristics you require.



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*Milwaukee 4, Wisconsin, U. S. A.*

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★ MECHANICAL TUBING ★ GLOWELD WELDED STAINLESS STEEL TUBES ★ SEAMLESS STAINLESS STEEL TUBES

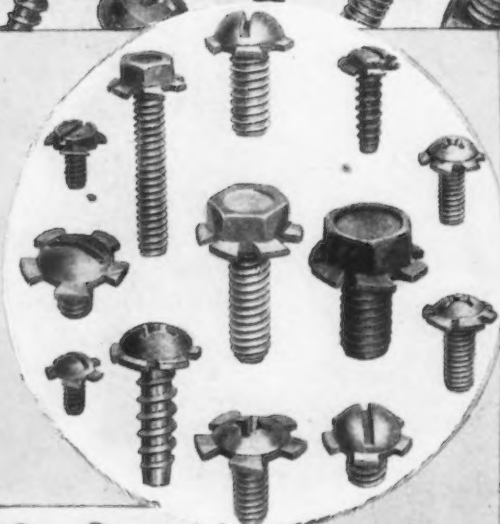


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Yes, our Engineering and Laboratory Staffs can lick your fastening problems as efficiently and economically as they've licked thousands of others.

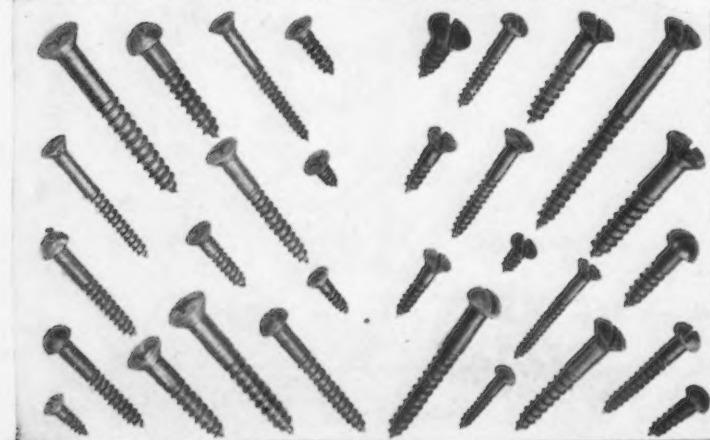
Let us know your present difficulties. We'll thoroughly analyze them and recommend fastenings with the correct, scientifically determined design, material heat treatment, temper and finish. Our technicians will also be glad to study the fastening requirements in your post-war products plans, and recommend time-saving, cost-reducing methods that will add strength and endurance to the fastened parts.



At Top: SPECIAL fastenings and parts selected from thousands we continually produce to order.

In Circle: "Lock-Tite" screws. The lock washer is part of the screw.

At Bottom: "Thread-forming" Sheet Metal Screws eliminate tapping by cutting perfect mating threads in the material.



**CONTINENTAL**  
**SCREW CO.** New Bedford, Mass., U.S.A.

## NEWS OF INDUSTRY

### Tariff League Chides Attempt to Link World Trade and Employment

••• Increased international trade, in itself, should not be held out as a panacea for the world's ills, the American Tariff League said recently in an analysis of the recently published State Dept.'s "Proposals for Expansion of World Trade and Employment."

"Maximum employment depends on maximum production," the League stated, pointing out that production creates and increases wealth, whereas trade only facilitates its distribution and consumption. "Invariably as a nation prospers through increasing and diversified production, its international trade increases."

"It is grossly misleading to make foreign trade appear as the alpha and omega of national well-being," the league declared. "It should be made clear that some nations are far more dependent on foreign trade than others."

"Many nations hope that the United States will furnish a market for their exports," the league stated. "Within reason it will do so if prosperous. But to set our policy to meet the maximum needs of foreign countries even though such a policy will entail major social and economic shifts at home, seems both undesirable and dangerous."

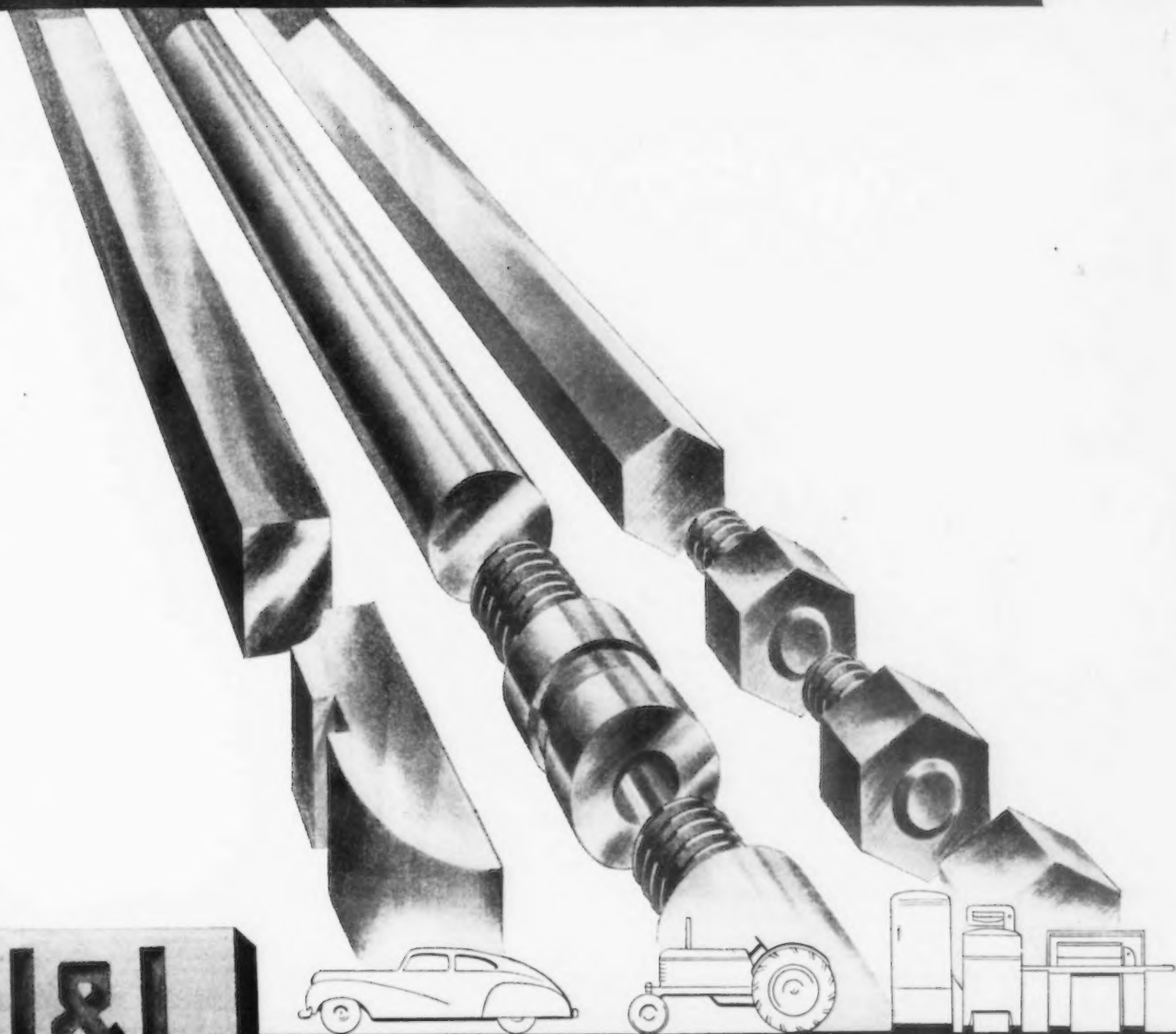
The economic conditions which have enabled the United States to take a leading and generous part in reestablishing foreign countries and promoting a world organization, should not be destroyed at the conference table, the league believes, particularly since the State Dept. program offers "no indication of any intention to work for greater uniformity of wages, hours or relative efficiency in the activities of different people of the world."

The United States has almost nothing to offer in exchange for the removal of foreign quotas, licenses, exchange controls and similar devices, according to the league declaration. "We are asked to trade our remaining tariffs against these barriers. But what an unequal trade that would be. When all United States tariffs had been traded away the other nations would still have their tariffs, which



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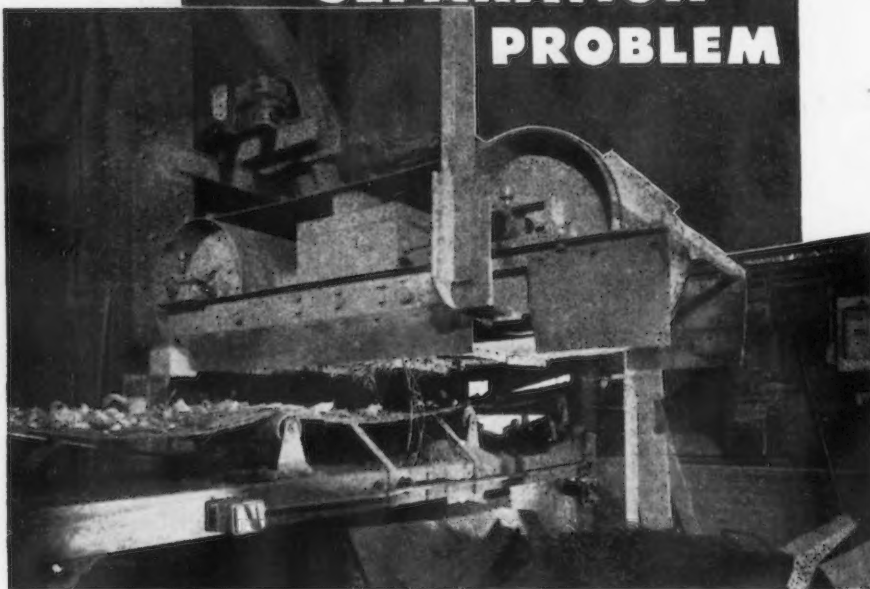


**J&L  
STEEL**

In addition to improved machinability and longer tool life obtained through use of J&L Cold Finished steel, many manufacturers specify this precision product for its improved surface finish. They also obtain in J&L cold drawn and cold rolled bars and special shapes the higher physical qualities needed for parts of modern high-speed machines. J&L engineers and metallurgists will be glad to assist you with your production problems. Write or phone your nearest J&L office.

**JONES & LAUGHLIN STEEL CORPORATION**  
PITTSBURGH, PA.

## How the New Dings Self-Cleaning Rectangular Magnet Solved a TOUGH SEPARATION PROBLEM



the

### PROBLEM

Installing an effective magnetic separator in a large steel castings foundry for removal of scrap from the shakeout sand conveyor belt was difficult because of space limitations at the belt end preventing installation of a magnetic pulley, plus a large percentage of metal and a thick normal burden of material on the belt.

the

### SOLUTION

Dings Engineers recommended installation of one of the powerful new Dings Self-Cleaning Rectangular Magnets above the conveyor. This machine provides the necessary magnetic strength to lift scrap out of the heavy burden efficiently, and gives clearance above the belt sufficient to prevent jamming even under unusually heavy load conditions. A transverse belt carries accumulated scrap off the conveyor and dumps it alongside, as shown above.

This is one example of the work in solving magnetic separation problems that Dings Engineers are doing throughout industry. And Dings "High Intensity" Magnetic Separators stay on the jobs that are set for them, year after year, and at costs for operation and maintenance that are negligible in even the smallest foundry's cost sheets.

Write today for full details on the complete line of Dings "High Intensity" Magnetic Separators. If yours is a special problem, Dings Engineering Service is available at no obligation to you.

**Dings Magnetic Separator Co.**

516 E. Smith St., Milwaukee 7, Wis.

# Dings

"HIGH INTENSITY"

"Magnetic Separation Headquarters Since 1899"

in most cases are now higher than those of the United States."

Concerning the State Dept. proposal for inter-governmental commodity agreements that might control production in the United States and other countries by international arrangement, the league stated, "It is yet to be demonstrated that government cartels are any better than private ones."

Declaring that the State Dept. publication "implants the idea that all tariffs are arbitrary and bad," the league declared, "it would be very easy to make the declaration an honest and reasonable one by calling for reduction of unreasonable or unnecessary tariffs."

Wherever American goods can be efficiently produced at low unit cost, it should be "the objective of the United States to permit the maximum of trade without unnecessary restriction," according to the league. Wherever such costs cannot be brought any lower, the United States policy should be "to impose only such restrictions, and to such a degree, as will provide approximate equalization to the end that trade is possible with all nations without impairment of the higher standards of the United States. It should be the further policy of the United States to continue free importations from all nations of those products which it does not itself produce or of which production is insufficient to supply its needs."

## General Campbell Retires

Washington

• • • Lt. Gen. Levin H. Campbell, Jr., Chief of Ordnance of the United States Army, retired recently to become vice-president of the International Harvester Co. He will assume his new duties on Mar. 1.



Lt. Gen.  
Levin H. Campbell

Recognized as an outstanding engineer and administrator, General Campbell directed the Ordnance procurement task throughout the war years. In his new job he will coordinate International Harvester's plant construction involving the investment of over \$100,000,000.



# Information Free

## (1) Containers:

Information on various types of containers now being manufactured, along with new box design for different products are given in this new booklet. *General Box Co.*

## (2) Radial Power Saws:

Manual offers woodworking men a reference guide on the use of radial power saws for all operations. Mechanical adjustments for control and maintenance of accuracy of every setting of the saws are illustrated. *DeWalt Products Corp.*

## (3) Studs:

Folder illustrates activities in stud producing plant. Steel, cadmium or zinc plated studs can be furnished according to specifications, plated or plain. *Stainless Ware Co. of America.*

## (4) Blind Riveting:

Operation, advantages, installation, application and inspection of blind rivets, and the Huck blind riveting process are described and illustrated in this folder. *Huck Mfg. Co.*

## (5) Clutches:

The design principle of floating disc clutches is shown and installation data, sizes, dimensions, etc. are given in this booklet. *Carlyle Johnson Machine Co.*

## (6) Refractories:

Folder features suspended type wall arch and roof construction. Details of construction and applications are illustrated. *Chicago Fire Brick Co.*

## (7) Cranes:

Specifications and capacities of various locomotive and truck cranes are given. Illustrations show applications of cranes on varied projects. *Browning Crane & Shovel Co.*

## (8) Case Hardening:

Case hardening in Surface Combustion standard rated furnaces is described in this 4-page bulletin. Also shown are applications of pack, liquid and gas carburizing. A table of pot recommendations is included. *Surface Combustion Corp.*

## (9) Boring Machine:

A 16-page catalog on Model C Milwaukee Autometric Boring Machine. It contains operating data, applications and setups, complete accessories lists and specifications. *Kearney & Trecker Products Corp.*

## (10) Wire Stripping Machine:

Data sheet and bulletin covering redesigned wire stripping machine. Machine embodies latest developments in tool steels, annealed castings, cutting jaws and easy operating foot mechanism. Stripping jaws are available for all types of insulated wire up to 1/2 in. diam. *Lead-All Products Co.*

## (11) Metro Positioner:

Folder shows Metro Positioner, a tool for mounting a vise or fixture or to be used as an angle plate. The positioner holds or mounts work rigidly for checking, milling, drilling, shaping, boring, welding and pattern making. *Metro-Vise Co.*

## (12) Gas Equipment:

Complete data sheets giving descriptions, specifications, capacities on atmospheric gas injectors, gas torch assemblies, multiring burner assemblies, blast tips and other related products are offered. *Bryant Heater Co.*

## (13) Hydraulic Elevating Tables:

Special features, optional equipment and specifications of the Lyon-Raymond portable hydraulic elevating tables are given in this illustrated folder. Table is elevated by means of a foot pedal leaving workman's hands free to manipulate load. *Lyon-Raymond Corp.*

## (14) Tool Steels and Forgings:

New catalog gives applications, analysis, hardness and tempering temperatures to give specific Rockwell hardness. It also contains standard classification of high speed and tool steel extras. *McInnes Steel Co.*

## (15) Synthetic Rubber Parts:

Informative booklet is designed as a guide to engineering departments in securing molded parts of synthetic rubber. It gives typical development procedures worked out during the war and lists 14 laboratory controls used. *Aero-Seal Rubber Products.*

## (16) Shaded Pole Motors:

Principal dimensions, selection tables and methods of mounting of shaded pole motors in ratings from 1/200 to 1/20 hp. are shown in this catalog. These motors are said to represent the simplest form of ac types. Both normal and high starting torque designs are available. *Robbins & Myers, Inc.*

## (17) Valve Lubricant:

A new and completely re-edited manual featuring the uses of valve lubricants. More than 100 specific valve services are included, with corresponding lubricant recommendations, for various conditions of fluid, temperature and pressure. *Meroo Nordstrom Valve Co.*

## (18) Beryllium:

This leaflet gives comprehensive information on the advantages and applications of beryllium. Of simple atomic structure, it is the only light metal with a high melting point, and provides superior advantages for X-ray transmission and sound velocity, leaflet points out. *Brush Beryllium Co.*

## (19) Automatic Plating:

Folder describes compact full automatic plating machine adaptable to 80 pct of all quantity plating jobs. Features counter-balanced hydraulic tank transfer control, versatile work carrier mechanism, standard replacement parts. *Udy-Lite Corp.*

## (20) Counting Devices:

New ease and convenience in the selection of counting devices is afforded by an 8-page brief catalog, which lists stroke and revolution counters, electric counters, coil winding counters and predetermined electric counters with application information. *Production Instrument Co.*

**NOTICE TO READERS:** Your request for this information will be forwarded promptly to the manufacturer issuing the literature. The offer is good for only two months.

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## INFORMATION FREE (Continued)

### (21) Boring Tools:

Block-type boring tool described in this booklet is designed for production on rough boring, semi-finishing and reaming operations. Quick detachable cutter block provides self-centering, positive locking, quick inserting of block in boring bar and easy removal. *Gairing Tool Co.*

### (22) Safety Guard:

Safety guard for power presses based on the principle of the interlocking switch is described in this brochure. *Junkin Safety Appliance Co.*

### (23) Etching Marker:

Etching marker described herein is an electro-chemical device, consisting of a small metal case containing a rectifier power kit, a pad-roller electrode, connecting cords, tips and clip, stencil paper and conditioner, and electrolytic chemicals, operating on 110, single phase, ac current. *Nagle Bros.*

### (24) Stainless Steels:

Folder, "Characteristics of Rezistal Stainless Steels," gives extensive metallurgical and mechanical data on this steel. *Crucible Steel Co. of America.*

### (25) Industrial Trucks:

Types of loads and economical methods of handling them with platforms and industrial power trucks are dealt with in four bulletins, which supplement the booklet "Industrial Logistics: A Survey for Management," recently issued by the company. *Elwell-Parker Electric Co.*

### (26) Rubber Products:

The opening pages of this 12-page booklet are devoted to Koroseal, the synthetic flexible material which has many uses. Two pages are given to a description of the company's diversified line of Vibro-Insulators. Rubber lined equipment is described and pictured. *B. F. Goodrich Co.*

### (27) Gear Tooth Machining:

Booklet describes and pictures special automatic machines, standard machines, gear tooth pointing, rounding, burring and chamfering machines. *Cross Co.*

### (28) Automatic Fire Alarm:

The Atmo automatic fire alarm described herein is a pneumatic-electric system utilizing the principle of the expansion under heat of air contained in a circuit of capillary copper tubing running through the area to be protected. Complete description of the system and its installation are given. *J. H. Scharff, Inc.*

### (29) Industrial Equipment:

Booklet contains a cross-section picture of the company's standard and specially designed tubing and fittings, pickling and heat treating equipment, corrosion resisting rolls, miscellaneous items and describes company's facilities for making special and standard equipment. *Youngstown Welding & Engineering Co.*

### (30) Plastics:

Booklet presents information on Neillite and Neillite moulding compounds, thermoplastic materials and other new plastic materials developed in recent years. Molding methods and pages illustrating stock molds and custom molds are also included. *Watertown Mfg. Co.*

### (31) Tractor Equipment:

Eight-page folder describes and pictures company's full tractor equipment line, and details of current models of LeTourneau carryall scrapers, tiltdozer, rotozers, cranes and power control units. *R. G. LeTourneau, Inc.*

### (32) Thermostats:

Catalog of prices for Type K thermostats, immersion thermostats, liquid thermostats, room type thermostats, Type L pressure switches, Type R pressure switches, Type P pressure and vacuum switches. *United Electric Controls Co.*

### (33) Magnets:

Bulletin gives a description of cold strip coil-handling magnets. Magnets are designed to lift single coils of finished strip steel on end without tilting. Details of construction, lifting capacities, weights and current requirements are covered. *Electric Controller & Mfg. Co.*

### (34) Presses-Grinders:

Booklet features presses with automatic pressure control in sizes up to 70 tons; 60-ton and 40-ton hydraulic pressurematic unit, and attachments for all presses are also covered. Other booklets present the combination multi-purpose grinder with adjustable work head and auto-sizer and the horizontal wet surface grinders. *Lempco Products, Inc.*

### (35) Machining Magnesium:

Booklet outlines the tools to be used in the machining of magnesium castings, the purpose of cutting fluids, how to avoid distortion, methods of protecting magnesium, procedure for polishing and cleaning and available chemical treatments. *Superior Bearing Bronze Co., Inc.*

### (36) Conveyor:

New Link-Belt oscillating trough conveyor which can handle practically any material and can be installed in any length, is outlined in this folder along with a study of typical installations. The conveyor is available in two types—short hangar and long hangar construction. *Link-Belt Co.*

### (37) Motion Study:

Booklet tells the story of the motions required to keep records over the past 50 yr and describes the Diebold Cardineer record keeping equipment built to meet requirements for maximum efficiency. *Diebold, Inc.*

### (38) Couplings:

Buffalo torque control couplings which may be quickly adjusted to a fixed tension are pictured and described in this folder. Tables, specification charts and methods of adjustment are also included. *Buffalo Machinery Co., Inc.*

### (39) Regulators:

Bulletin lists available ranges of standard Seco automatic voltage regulators with descriptions and illustrations applicable to many electrical and mechanical requirements. *Superior Electric Co.*

### (40) Surface Grinder:

How to make your surface grinder do cylindrical work is shown in this booklet. The workings of the multi-purpose grinder attachment, how to elevate the front and back, how to use indexing feature and how to change heads is described. *Strong Mfg. Co.*

### (41) Convection Furnaces:

Uses of the Hevi Duty pit type convection furnaces are listed in booklet, along with data on furnace arrangement, insulation, heat barriers, heating element construction, fans, protective atmosphere, control, baskets and other information. *Hevi Duty Electric Co.*

### (42) Cranes:

Underhung push type cranes of single girder construction and top running push type cranes are illustrated and described in this folder. *Industrial Equipment Co.*

THE IRON AGE, New York 17, N. Y.

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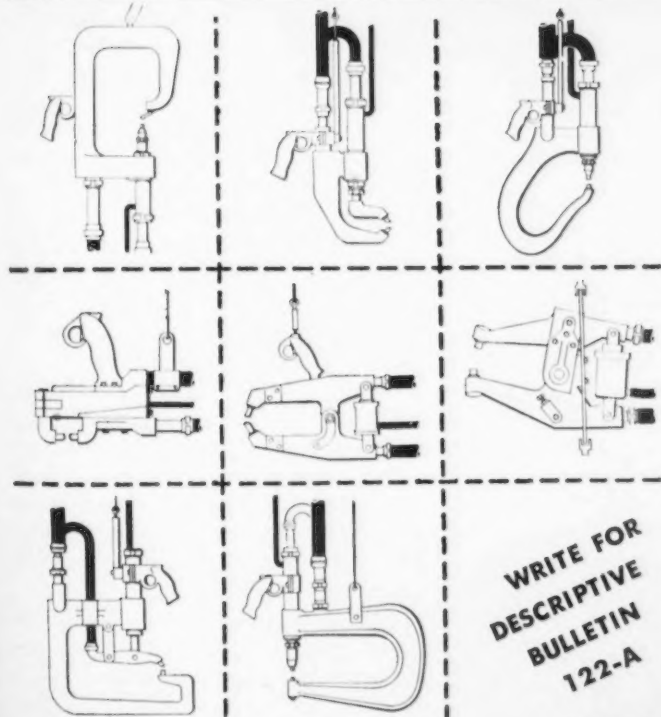
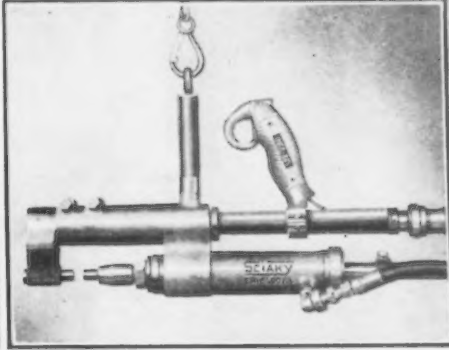
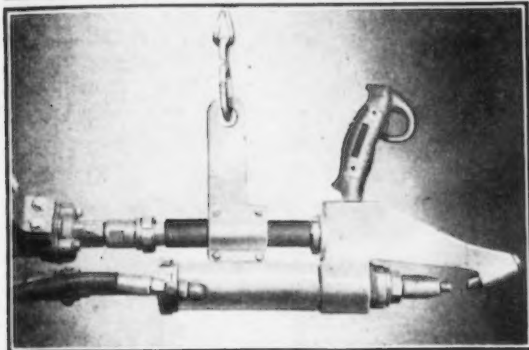
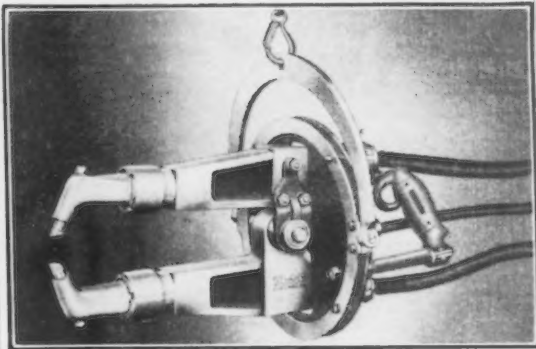
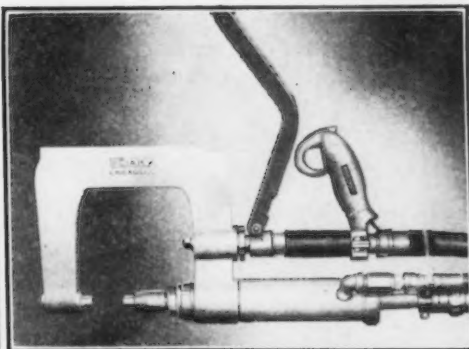


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- \*Removable tips . . . easy replacement or mounting of different types.
- \*Cylinders on both "alligator" and "C" type guns can be made for different strokes.
- \*Special construction positions moving electrode very close to border of gun.
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## NEWS OF INDUSTRY

### Electronic Computer Assures Solution Of Scientific Problems

Washington

••• A new all-electronic calculating machine that is expected to revolutionize the mathematics of engineering and change many of our industrial design methods has been announced by the War Dept.

Designed and constructed for the Ordnance Dept. at the Moore School of Electrical Engineering of the University of Pennsylvania by a pioneering group of Moore School experts, this machine is the first all-electronic general purpose computer ever developed. It is capable of solving many technical and scientific problems so complex and difficult that all previous methods of solution were considered impractical.

This mathematical robot, known as the ENIAC (Electronic Numerical Integrator and Computer), is the invention of Dr. J. W. Mauchly and Mr. J. Presper Eckert, Jr., both of the Moore School. Begun in 1943 at the request of the Ordnance Dept. to break a mathematical bottleneck in ballistic research, its peacetime uses extend to all branches of scientific and engineering work.

The ENIAC is capable of computing 1000 times faster than the most advanced general-purpose calculating machine previously built. The electronic methods of computing used in the ENIAC make it possible to solve in hours problems which would take years on a mechanical machine.

Containing close to 18,000 vacuum tubes in its mechanism, the new machine is a giant of electronic precision. It occupies a room 30 ft by 50 ft and weighs 30 tons.

Although the machine was originally developed to compute lengthy and complicated firing and bombing tables for vital ordnance equipment, it will solve equally complex peacetime problems such as nuclear physics, aerodynamics and scientific weather prediction.

The new machine does not remove the need for legitimate experimentation, whose purpose it is to discover fundamental principles and factors which affect these principles. Likewise, it was pointed out that the electronic calculator



does not replace original human thinking, but rather frees scientific thought from the drudgery of lengthy calculating work.

Cost estimates of the ENIAC run to about \$400,000. This includes all research and development work; future machines of this type could be produced much more cheaply.

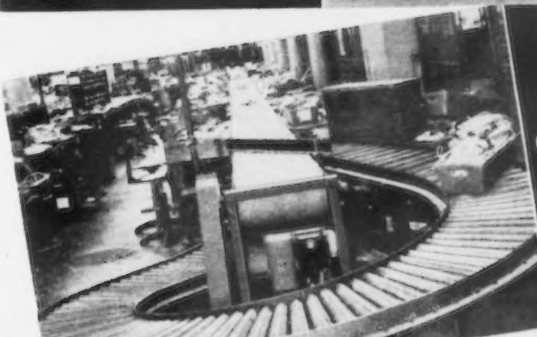
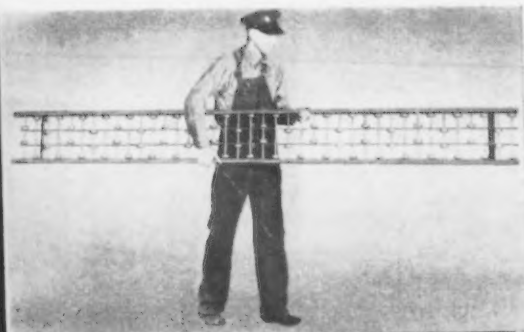
The speed of this computer is phenomenal. The first problem put on the ENIAC, which would have required 100 man-years of trained computer's work, was completed in two weeks—of which 2 hr was actually electronic computing time, and the remaining time devoted to review of the results and details of operation. If used to complete capacity, the ENIAC will carry out in 5 min more than ten million additions or subtractions of ten digit numbers. The machine performs a single addition in  $1/5000$  of a sec. (and can do a number of distinct additions simultaneously); a single multiplication by a ten-digit multiplier in  $1/360$  of a sec.; a nine-digit result in division or square rooting in  $1/38$  of a sec.

While there are no moving parts in the computer, the heat generated by the multitude of vacuum tubes is dissipated by a temporary blower system which does create some noise. This condition will not exist when the ENIAC is installed in its specially designed air-conditioned building at its permanent location at Aberdeen Proving Ground. External to the ENIAC, but a part of the total installation are two comparatively small machines which feed information into the ENIAC from punched cards and receive the results therefrom in a similar manner.

The ENIAC consumes 150 kw. This power is supplied by a three-phase regulated, 240-volt, 60-cycle power line. The power consumption may be broken up as follows: 80 kw for heating the tubes, 45 kw for generating dc voltages, 20 kw for driving the ventilator blower and 5 kw for the auxiliary card machines.

Special test equipment allows many of the circuits to be easily tested. This includes a special test bench with its own power supply and electronic and oscillographic equipment, so that individual units may be withdrawn and tested with-

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**W**HATEVER you have to handle — packages, parts, units,—from receiving of raw material through manufacturing or processing to storage or shipping, Standard equipment can speed operations — save time and cost.

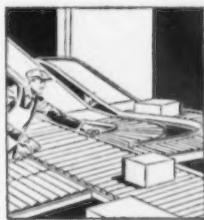
An 8 to 10 ft. section of Standard Wheel Conveyor expedites "spot" handling — a Standard Handibelt or Handipiler portable unit stacks and piles packages easily and quickly to ceiling height or loads and unloads cars and trucks with ease and dispatch — a Standard system of power or gravity conveyors accelerates

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out interfering with the operation of the ENIAC.

The general method of handling a problem with this machine is as follows: First, the scientist must analyze his problem so that he can write down mathematical equations that express the phenomena involved. Second, he must break down the mathematical formulation into a sequence of additions, subtractions, multiplications, divisions, square rootings and transfers from unit to unit of the ENIAC so that the ENIAC can be instructed to make the computations. Finally, a small amount of time is required in preparing the ENIAC for a problem by such steps as setting program switches, putting numbers into the function table memory by setting its switches, and establishing connections between units of the ENIAC for the communication of programming the numerical information.

A most important field for mathematical analysis is that of strength of materials. Many engineering



**MATHEMATICAL WHIZ:** ENIAC, the all-electronic calculating machine, is shown being prepared to solve a hydrodynamics problem. The 40 main panels of the computer are arranged in a large U, with 16 of the panels on each leg and 8 panels on the end. Viewing the U from the inside the panels arranged from left to right are: control and initiating unit, cycling unit, master programmer, first function table, accumulators 1 and 2, divider and square rooter, accumulators 3 to 10, multiplier, accumulators 11 to 18, second function table, third function table, accumulators 19 and 20, constant transmitters and printer.

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specifications of mechanical parts are still prepared by off-hand estimates or gross rule-of-thumb methods, because no better information can be secured without lengthy and costly investigation. As a result, either the parts are much stronger than necessary or unexpected failures occur. Mathematical analysis of even simple parts can involve very complicated equations, and many variables. With the ENIAC, not only can particular design problems be handled in a practical manner, but more accurate data on specific materials can be obtained through analyses of what happens when test specimens fail.

Aircraft design and research are extremely costly processes, because of the need for wind tunnel experimentation. The designers of ENIAC believe that from 30 pct to 50 pct of this type of experimentation could be eliminated by use of high speed calculation. The entire field of hydrodynamics, or the mechanics of fluids in motion, is sorely in need of mathematical treatment. Such problems as turbulence, for instance, involve so many variables as to put analogy machines almost in the realm of guesswork.



## Announces Additional Dealers Licensed To Sell Machine Tools

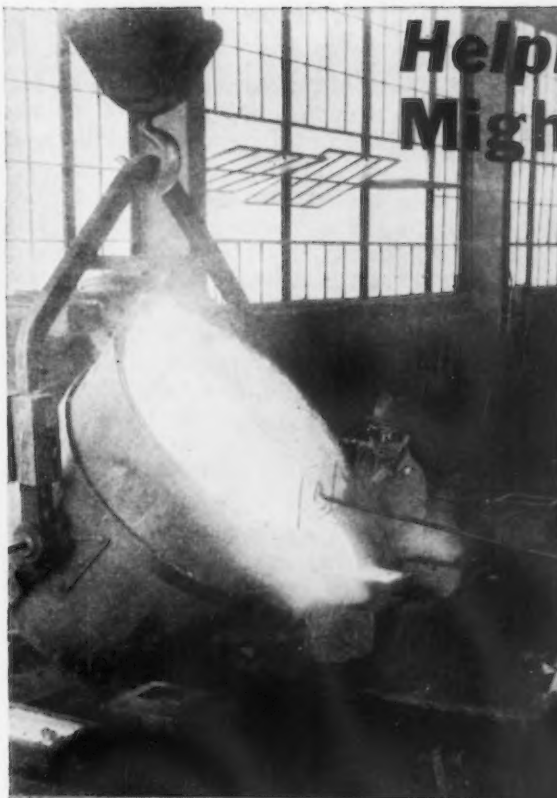
Washington

• • • Sales of government-owned surplus machine tools and production equipment through approved dealers in January, the first month of operation of the dealer agency plan, totaled \$1,682,593, according to teletyped reports to the statistical and Economic Div. of the War Assets Corp. That sales through dealers are being stepped up as problems of the plan are being ironed out, is indicated by the fact that they rose sharply in the last half of the month over the first half. As the operation of the plan is being perfected and the number of approved dealers grows—at the end of January 777 had been approved and there were 555 applications in the agencies awaiting action—dealer sales are being progressively accelerated. Direct sales by WAC regional agencies are estimated at a rate of about \$1 millions a day.

For the period of Jan. 16-31, dealer sales aggregated \$1,342,617 compared with only \$339,976 in the first half monthly period. The last half sales yielded 49.6 pct of the reported cost of the machine tools and production equipment, amounting to \$2,705,485, while the first half sales represented 42.6 pct of the reported cost of \$798,158. Dealers are allowed a commission of 12½ pct on sales they negotiate. The largest dealers' sales in January were in the Chicago area and totaled \$458,868. The second heaviest dealer sales were in the Cleveland area with a total of \$377,023, followed by sales of \$280,707 in the Detroit area.

While there are still dealer-agency problems to be worked out between the metalworking machinery advisory committee and WAC officials, some of the chief ones have been eliminated as the result of conferences. Obviously, the complaints made by dealers have not always been settled to their satisfaction but it is conceded generally that WAC officials have given them careful consideration and applied the Surplus Property Act, under which they operate, as they fairly interpret it.

One of the more serious complaints of dealers was that some



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**Gardner-Denver Co.\***

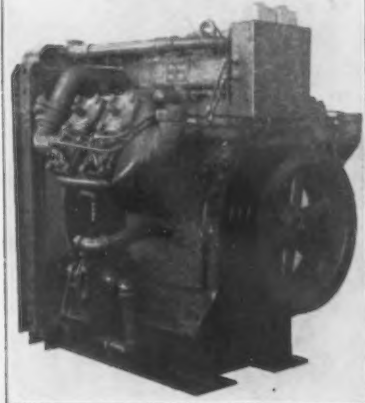
Many castings made by the Gardner-Denver Company for their air compressor units are both intricate and exacting. They must be relatively flawless . . . uniformly strong . . . able to withstand high pressures.

Needless to say, a great deal of skill and "know how" goes into the making of Gardner-Denver castings . . . materials are chosen with judgment and care. We are indeed proud that Keystone core wire has been selected to add its bit to the quality of Gardner-Denver products.

\*Gardner-Denver Co., Quincy, Illinois

**KEYSTONE STEEL & WIRE CO.**  
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One of Gardner-Denver's huge air compressor units—completely assembled and ready for heavy duty service.



Special Analysis Wire  
for All Industrial  
Uses



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Annealed,  
Galvanized

regional office managers had overlooked dealers and had given preference to requests for tools coming direct from users of tools. This failure, it was urged, has resulted in an attempt to withhold the dealer's commission, even though the dealer has worked to consummate the sale, particularly in sales where the prospect has applied personally to RFC.

To this complaint WAC officials have ruled that it is a matter of discretion when business is given to dealers. Where dealers have performed no function and prospective buyers have already negotiated with RFC, no commissions will be paid.

Complaint was made of variation in regional-office handling of orders that dealers had submitted. Dealers claimed that bona fide orders for machines in plants had been rejected on the ground that sales from plants are not covered under the dealer agency agreements and that a commission would therefore not apply. This complaint has been resolved in favor of dealers. RFC has issued instructions to its regional agen-

cies that dealer agents will be recognized in accordance with the agreement in spot sales, both at plant and warehouse sites.

Another trouble that has been wiped out is the insistence of certain regional offices upon a city dealer license. Such licenses are no longer required.

The bothersome problem of erroneous government shipments also is being overcome. WAC officials report that they are getting better RFC catalog descriptions, and are allowing within reason inspection of wrapped merchandise. Also, it was pointed out, they are inventorying and listing equipment as fast as possible with the aid of consultants and experts. It was explained that in view of the gigantic task involved there necessarily has been delay in this as well as in other operations.

To the complaints of delays caused by reserving for federal and state priorities, WAC officials pointed out that they are governed by the Surplus Property Act. That these so-called delays are not delaying sales, it was said, is evidenced by the large quantities of

machine tools being sold daily.

Contention that RFC offices have been unwilling to accept industry advice was declared to be unfounded. On the contrary WAC officials said that there are scrap panels in all the agencies and they are composed chiefly of outside experts. The Government representatives emphasized that they are always open to advice and counsel. They added that they have hesitated to call upon industry too much because to do so might require more time for Government work than industry representatives could spare without remuneration.

Dealers have pointed out that scrapping of surplus machine tools in the Detroit area is a pressing problem because so many of them are special. To this, WAC officials said that they are reluctant to scrap special tools until exhaustive determination has been made to see if the tools can be converted to civilian use.

Additional dealers who have been named to handle surplus tools are as follows:

#### ATLANTA

Cleveland Electric Co., 557 Marietta St., NW, Atlanta  
C. Y. Strausz & Co., 319 Spring St., NW, Atlanta  
Allison Machinery Co., 575 Edgewood Ave., SE, Atlanta  
Southeastern Purchase & Sales Co., 1608 Candler Bldg., Atlanta

#### BIRMINGHAM

George M. Meriwether, 2226 Third Ave. N., Birmingham  
Tool Engineering Service, 505 N 22nd St., Birmingham  
Ace Machinery Co., 2216 First Ave. S., Birmingham  
The Young & Vann Supply Co., 1729 First Ave. N., Birmingham  
W. W. Whorten, 6226 First St. N., Birmingham  
Birmingham Armature Electric Co., 821 N 21st St., Birmingham  
R. E. Boggs, 1427 S 18th St., Birmingham

#### BOSTON

Henry S. Iversen Machinery Co., 205 Church St., New Haven, Conn.  
The State Machinery Co., Inc., 865 Congress Ave., New Haven, Conn.  
Terminal Machinery Co., 567 Atlantic Ave., Boston  
Cassiere Machinery Co., 191 Eddy St., Providence  
Melville L. Merrill Machinery, 410 Asylum St., Hartford  
Standard Machinery & Supply Co., Boston  
B. D. Brooks Co., Inc., 361 Atlantic Ave., Boston  
The E. A. Eddy Machinery Co., Inc., 186 W Exchange St., Providence  
Pratt & Whitney—Div. of Niles-Bement-Pond Co., Charter Oak Blvd., W Hartford, Conn.  
Joseph Beal & Co., 465 Atlantic Ave., Boston  
Associated Machinery Co., 142 Oliver St., Boston  
Lee & Co., 410 Dorchester Ave., Boston

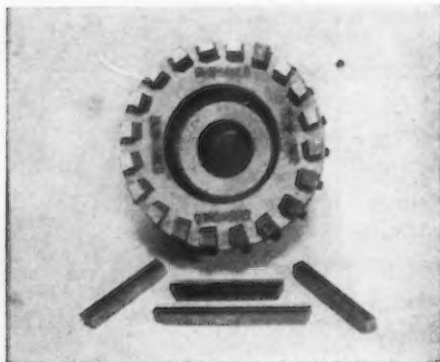
#### CHARLOTTE

Morris Speizman Co., Inc., 508 W Fifth St., Charlotte, N.C.  
S. W. Harrington, P.O. Box 230, Asheville, N.C.

#### CHICAGO

General Equipment Engineering Co., 3530 W Pierce St., Milwaukee

## A Revolutionary Development In Milling



The outstanding performance attained with "CUSHIONED" 12% Cobalt High Speed Steel bits for general purpose tools naturally led to the application of this same "CUSHION" principle to Milling Cutter Blades.

Actual results with the "CUSHIONED" Milling Cutter Blades have been even more remarkable than in the case of the "Cushioned" H.S.S. Bits.

For example: Using a 6" diameter cutter with 20 teeth

we are milling a steel (similar to SAE 4150) attaining a stock removal at the previously unheard of rate of 4½ cu. in. per horsepower per minute.

And it will handle harder materials than has heretofore been possible. We have milled up to 600 Brinell with surprising speed.

Blades are from 66 to 69 Rockwell "C" hard.

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## NEWS OF INDUSTRY

Donberg & Danits, 400 S Clinton St., Chicago  
 Bansbach Machinery Co., 3911 W Madison St., Chicago  
 Gilmore Machinery Co., 30 S Clinton St., Chicago  
 The Fader Machinery Co., Inc., 23 N Jefferson St., Chicago  
 C. R. Daniels Machinery Co., 5135 N 32nd St., Milwaukee  
 John J. Normoyle Co., 607 Third Ave., Moline, Ill.  
 Rockford Machine Tool Co., 2500 Kishwaukee St., Rockford, Ill.  
 Willis Stutson Associates, 184 N Wacker Drive, Chicago, Ill.  
 F. W. Burns Machinery Co., 1730 W North Ave., Milwaukee  
 Active Machine & Tool Co., 1036 W Lake St., Chicago  
 Iron & Steel Products Co., 135th & Brainard Ave., Chicago  
 Engineering Sales Co., 621 N Illinois St., Indianapolis  
 Segal Machinery Co., 115 S Clinton St., Chicago  
 State Machine Tool Co., 1441 N Third St., Milwaukee  
 Production Service, 162 E Ontario St., Chicago  
 Long Sales Co., 6207 Seventh Ave., Kenosha, Wis.  
 J. Ralph Roach, 30 N LaSalle St., Chicago  
 C-Jay Machinery Co., 4456 W Madison St., Chicago  
 Davis & Murphy, 5252 Broadway, Chicago  
 W. J. Niblock Machinery Co., 1002 Johnson St., Elkhart, Ind.

### CLEVELAND

Dayton Machinery Sales, 3715 E 104th St., Cleveland  
 Tool City Service Corp., 1370 Ontario St., Cleveland  
 Hetz Construction Co., 2500 W Market St., Warren, Ohio  
 A. L. Bechtel Machinery Co., Box 3962, Shaker Heights 29, Ohio  
 Rank W. Andersen, Cleveland Railway Bldg., Cleveland  
 The Ajax Mfg. Co., 1441 Chardon Road, Euclid, Ohio  
 The Cleveland Duplex Machinery Co., Inc., 626 Penton Bldg., Cleveland  
 Collier Co., 8015 Carnegie Ave., Cleveland  
 J. J. Dugan & Co., 7100 Euclid Bldg., Cleveland  
 Erco Distributing Co., 1625 Fifth St., Sandusky, Ohio  
 Harry N. Harvey, 47 Cherokee Trail, Willoughby, Ohio  
 Jeffery-Gilles Co., 610 Caxton Bldg., Cleveland  
 W. K. Stamets Co., 4026 Jenkins Arcade Bldg., Pittsburgh  
 Strong, Carlisle & Hammond Co., 1392 W Third St., Cleveland  
 Weaver Machinery Co., 1341 E 111 St., Cleveland  
 T. R. Wigglesworth Machinery Co., 1721 Superior Ave., Cleveland  
 Diamond Sales & Engineering Co., 12 N Third St., Columbus  
 Noll Equipment Co., 2176 E 13th St., Cleveland  
 L. & W. Machinery Co., 1699 W 25th St., Cleveland  
 Saunders Machinery Exchange, 2036 E 100th St., Cleveland  
 Balcher Machinery Sales, 1861 E 24th St., Cleveland  
 Garco Machinery Co., 3030 Euclid Ave., Cleveland  
 Herman Machinery Co., 11107 Earle Ave., Cleveland  
 Horvitz Merchandise Co., 1048 St. Clair Ave., Cleveland  
 International Steel Industries Co., 205 Marion Bldg., Cleveland  
 Lakeside Machinery Co., 1331 St. Clair Ave., Cleveland  
 Moslo Machinery Co., 2443 Prospect Ave., Cleveland  
 The Motch & Merryweather Machinery Co., 715 Penton Bldg., Cleveland  
 The Price-Thomas Co., 6928 Carnegie Ave., Cleveland  
 Adolph Friedman, 2909 Washington Blvd., Cleveland Heights, Ohio  
 A.E.S. Tools, Inc., 1948 Carter Road, Cleveland  
 K. E. Karlson & Son, 3435 Menlo Road, Shaker Heights, Ohio  
 The C. H. Gosiger Machinery Co., 108 McDonough St., Dayton  
 Joseph T. Ferguson Associates, Inc., 1491 E Main St., Columbus  
 Rickey Machinery & Supply Co., 800 Wager Road, Rocky River 16, Ohio  
 Bardons & Oliver, Inc., 1133 W Ninth St., Cleveland  
 The Monarch Machine Tool Co., Sidney, Ohio

# ABC statement of Material Handling Facts

for busy manufacturers with an eye on the shrinking spread between labor costs and price ceilings . . .



Most management men in industry are aware of the many advantages of mechanizing handling of material in plant and warehouse. The basic facts outlined below deserve the consideration of any executive concerned with this problem.



## THE CASE FOR POWER INDUSTRIAL TRUCKS

1. **They conserve manpower.** One operator with a power truck can do the work of 6-10 men with hand trucks.
2. **They conserve time.** Besides speeding transportation of material, they load and unload cars faster, and save time on many other handling operations.
3. **They conserve space.** Fork trucks, Hy-Lift trucks, and crane trucks can tier material to make floor space more valuable.
4. **They promote safety** by eliminating the strained backs, hernias, crushed fingers or toes and other accidents resulting from manual lifting.
5. **They speed production.** By keeping materials moving, bringing work right to machines, keeping aisles clear, fast changing of dies, they reduce idle machine time and step up production schedules.
6. **They are flexible.** Not limited by cranes or tracks, they can operate anywhere—indoors and out—wherever needed.



## THE CASE FOR ELECTRIC POWER INDUSTRIAL TRUCKS

1. **Continuous Operation.** Always dependable—always on the job, electric trucks are built for long, hard service. Changing batteries takes less time than changing oil or re-fueling non-electric trucks.
2. **Lowest Maintenance Cost.** Case histories show that with proper care, Baker Trucks can cost their owners as little as \$50 per year for maintenance and repair.
3. **Lowest Operating Cost.** Electric power is the cheapest power available for heavy duty industrial truck operation—even with cost of battery depreciation.
4. **Lowest Investment Cost**—when amortized over their many years of useful service. Most electric trucks are still going strong after 15 to 20 years of strenuous service.
5. **Maximum Safety.** Electric power is safe power—free from excessive heat, noxious fumes, and dangers of explosion or fire.
6. **Most Efficient Performance.** Smooth starting—powerful acceleration—more positive control—no gear shifting—these are some of the operating advantages of electric trucks.



## THE CASE FOR BAKER INDUSTRIAL TRUCKS

1. **Complete Line** for every type of industrial truck handling system. In addition to standard Low-Lift, Hy-Lift, Fork, Crane, and Platform Trucks, Baker makes tractors and a wide variety of special trucks for unusual handling operations. For example, Baker makes an Articulated Fork Truck for operation in narrow aisles and congested areas.
2. **Baker Representatives** in all principal industrial centers are qualified material handling engineers, available for counsel on your material handling requirements. They will help you select the proper equipment for your needs.
3. **Baker Engineering and Service** are dedicated to the continuous operation of all Baker Trucks. Adequate stocks of spare parts are maintained to meet emergencies. Baker representatives are available for consultation and help at all times and factory engineers

make periodic field trips throughout the country to insure satisfactory operation and to recommend proper truck care.

4. **Baker Motors** on all Baker Trucks are designed and built by Baker, to give greatest efficiency for their specific functions. Baker Travel Motors develop more horsepower and contain more copper and iron than any other motors of the same size.
5. **Baker Power Axle.** Careful selection of properly heat-treated steels, plus many exclusive design features, practically eliminate service failures and greatly reduce maintenance.
6. **Baker Duplex Compensating Suspension**—an exclusive Baker feature which holds power axle in alignment, and prevents twisting strains due to rough floor conditions from being transmitted to frame or steering rods.

These are a few of the advantages offered by Baker Electric Power Industrial Trucks. For further information, call in your nearest Baker representative, or write us direct.

**BAKER INDUSTRIAL TRUCK DIVISION**  
 of The Baker-Raulang Company  
 2175 West 25th Street • Cleveland, Ohio  
 In Canada: Railway and Power Engineering Corp., Ltd.



Member:  
 Electric Industrial  
 Truck Association

# Baker INDUSTRIAL TRUCKS

## DALLAS

Pollard Distributing Co., 2307 Madera, Dallas  
 Oliver H. Van Horin Co., Inc. of Tex., 1617  
 Main St., Fort Worth, Tex.  
 Marcuse Machinery Exchange, 2321 Prairie  
 Ave., Fort Worth, Tex.  
 Joe Edelman Sales Co., 109 E Erwin St.,  
 Tyler, Tex.  
 Aero Sales Co., 2925 Commerce St., Dallas,  
 Tex.  
 Hall Machine & Welding Co., 102-6 W Mer-  
 mod, Carlsbad, N. Mex.

## DENVER

Richard Ives Co., 661 W Colfax, Denver  
 Barnett Co., 3800 Wynkoop St., Denver  
 Bill Mesch Machinery Supply Co., 716 19th  
 St., Denver  
 General Machinery & Supply Co., 635 Walnut  
 St., Denver  
 Atlas Machinery & Supply Co., 45 South  
 Santa Fe Drive, Denver  
 Mountain Equipment Co., P. O. Box 1048,  
 Albuquerque, N. Mex.  
 E. F. Gobatti Engineering, 2301 N Grand  
 Ave., Pueblo, Colo.  
 S & M Supply Co., Box 247, Grand Junction,  
 Colo.  
 Great Western Pipe & Supply Co., 1324 13th  
 St., Denver  
 Aircraft & Airport Equip Co., 2705 High St.,  
 Denver  
 Morse Bros. Machinery Co., 2900 Broadway,  
 Denver

## DETROIT

Surplus Property Service, 1532 Buhl Bldg.,  
 Detroit.  
 Fero Industrial Equipment Purchasing Co.,  
 1015 Transportation Bldg., Detroit  
 Lenik's Machinery Sales, 12001 Lakepointe,  
 Detroit  
 Weyant Machinery Co., 3208 Eaton Tower,  
 Detroit  
 W. J. Hatten & Co., 1060 Parker, Detroit  
 John W. Rankin, 12834 Marlowe, Detroit  
 J. Lee Hackett Co., 1961 E Milwaukee Ave.,  
 Detroit  
 Hanson Equipment Co., 2832 E Grand Blvd.,  
 Detroit

Ford Machinery Sales, 417 E State Fair,  
 Detroit  
 John J. Morrow & Co., 5 W Larned, Detroit  
 Welding Sales & Engineering Co., 8759 Grin-  
 nell Ave., Detroit  
 Commercial Industrial Corp., 3110 E 7 Mile  
 Road, Detroit  
 Sadler Machinery Co., 7310 Grand River Ave.,  
 Detroit  
 Peninsular Machinery Co., 2921 E Grand  
 Blvd., Detroit  
 Morey Machinery Co., 2832 E Grand Blvd.,  
 Detroit  
 Production Machinery Sales Co., 4845 St.  
 Auin Ave., Detroit  
 Allan K. Trumbull, Route 2, Dowagiac, Mich.  
 Alvin M. Whirl, 16210 Inverness Ave., Detroit  
 Bradley Machinery Co., 211 Jos. Campau,  
 Detroit  
 Marquette Machinery Co., 18423 Greenlawn  
 Ave., Detroit  
 Empire Machinery Exchange, 12207 Hamilton  
 Ave., Detroit  
 Burleigh-Stocker Machinery Co., 1914 Fisher  
 Bldg., Detroit  
 E. R. Hagen, 156 Louise Ave., Detroit  
 Miles Machinery Co., 926 S Niagara St., Sag-  
 inaw, Mich.  
 Lakeshore Machinery & Supply Co., 400 W  
 Laketon Ave., Muskegon, Mich.  
 Reliable Machine Rebuilders, 8700 Brandt St.,  
 Dearborn  
 Monarch Engineering Co., 1491 E Eight Mile  
 Road, Hazel Park, Mich.  
 Standard Machinery Co., 351 Indiana Ave.,  
 NW, Grand Rapids, Mich.  
 Globe Trading Co., 920 W Lafayette Blvd.,  
 Detroit  
 H. C. Slonaker, 1719 Dime Bldg., Detroit  
 Kennametal, Inc., 5531 Woodward Ave.,  
 Detroit  
 Charles R. Mueller & Sons, Inc., 531 E La-  
 fayette, Detroit  
 H. J. Camden, 825 Hibbard Ave., Jackson,  
 Mich.  
 E. E. Wood Machinery Co., 2832 E Grand  
 Blvd., Detroit

## HOUSTON

Engineering Sales Co., 112 Portwood St.,  
 Houston

Chickering Tool & Equipment Co., 5001 Navi-  
 gation Blvd., Houston  
 Derby-Gibson Machinery Co., 430 Western  
 Union Bldg., Houston  
 Steel & Machine Tool Sales, 6416 Navigation  
 Blvd., Houston  
 Huge-Fayee Co., 1011 Caroline St., Houston  
 Machinery Tool & Engineering Co., 502 Stew-  
 art Bldg., Houston  
 Peden Iron & Steel Co., 700 N San Jacinto,  
 Houston  
 Preston Machine Tool Sales Co., 724 M & M  
 Bldg., Houston  
 Machinery Sales & Engineering Service, 1015  
 Second National Bank Bldg., Houston  
 Wessendorf, Nelms & Co., 320 Franklin Ave.,  
 Houston

## KANSAS CITY

Lilfeldt Mch. & Supply Co., 1219 McGee,  
 Kansas City  
 Schone & Johnson Machinery Co., 1117 Kan-  
 sas Ave., Kansas City  
 Paddock Tool Co., 1418 Walnut St., Kansas  
 City  
 Eichman Machinery Co., 235 W Eighth St.,  
 Kansas City  
 English Brothers Machinery Co., 410 W. Fifth  
 St., Kansas City

## LOS ANGELES

Century Machinery Co., 222 N Alameda St.,  
 Los Angeles  
 Frank E. Jones Machinery Corp., 1403 Santa  
 Fe Ave., Los Angeles  
 Henes-Morgan Machinery Co., Ltd., 2026 Santa  
 Fe Ave., Los Angeles  
 Al Heller Machinery Co., 763 S San Pedro  
 St., Los Angeles  
 Eccles & Davies Machinery Co., Inc., 1910  
 Santa Fe Ave., Los Angeles  
 Hoffman & Heartt, 2011 Santa Fe Ave., Los  
 Angeles  
 Craig Welding Supply Co., 5814 Santa Fe Ave.,  
 Los Angeles  
 Robert L. Hendry, 1231 S Lorena St., Los  
 Angeles

## MINNEAPOLIS

Charles W. Stone Co., 1019 Marquette Ave.,  
 Minneapolis  
 The John C. Eide Co., 200 Washington Ave.,  
 Minneapolis  
 Machinery Exchange Market, 254 First Ave.,  
 N, Minneapolis  
 Northern Machinery & Supply Co., 818 Lum-  
 ber Exchange Bldg., Minneapolis  
 The Satterlee Co., 118 Washington Ave.,  
 Minneapolis  
 Sales Service Machine Tool Co., 2426 Uni-  
 versity Ave., St. Paul  
 Machinery Equipment Co., 1300 Washington  
 Ave., Minneapolis  
 E. J. Koblas or United Hardware Distributing  
 Co., 801 Foshay Tower, Minneapolis  
 E. E. Taylor, 1641 Dayton Ave., St. Paul  
 Newberry Machine Tool Co., 1549 Ashland  
 Ave., St. Paul

## NASHVILLE

Strable-Johnson Supply Co., 1300 Broad St.,  
 Chattanooga, Tenn.  
 Hays Machine Tool Co., 269 S Front St.,  
 Memphis, Tenn.  
 Bert L. Sylar & Son, 105 Belvoir Ave.,  
 Chattanooga, Tenn.  
 Duncan Combs Co., 209 Eighth Ave. N.,  
 Nashville, Tenn.  
 W. C. Pitts & Son, 154 N Front St., Memphis,  
 Tenn.  
 Tennessee Machinery Co., 121-23 Third Ave.,  
 Nashville, Tenn.  
 Hawkins Bros., 2823 Sharondale Drive, Nash-  
 ville, Tenn.

## NEW ORLEANS

Dixie Mill Supply Co., Inc., 901 Tchoupitoulas  
 St., New Orleans  
 Stauss & Haas, Inc., 524 Camp St., New Or-  
 leans  
 Southern States Equipment Co., 425 Celeste  
 St., New Orleans  
 Oliver H. Van Horn Co., Inc., 1742 St.  
 Charles Ave., New Orleans  
 Murray-Baker-Frederic, Inc., 628 South Peters  
 St., New Orleans  
 Frederic & Baker, 825 Ardis Bldg., Shreveport  
 La., and 725 Canal Bldg., New Orleans

## NEW YORK

The B & M Machinery Co., Inc., 275 S Main  
 St., Stratford, Conn.  
 Richard P. Walsh Co., 30 Church St., New  
 York  
 Peabody Machinery Co., 23 Church St., Green-  
 wich, Conn.  
 China Motor Corp., 184 Jamaica Ave., Ja-  
 maica, N.Y.  
 Craftsweld Equipment Corp., 2626 Jackson  
 Ave., Long Island City, N.Y.



To match the high quality of your products every bolt, nut and rivet must be uniform . . . accurate and dependable. Oliver fasteners are made to meet the exacting standards of our "hard to please" engineers, and to pass the rigid tests of our inspectors. They measure up in every detail to the quality your products demand. Call in Oliver today, for your fastener needs.

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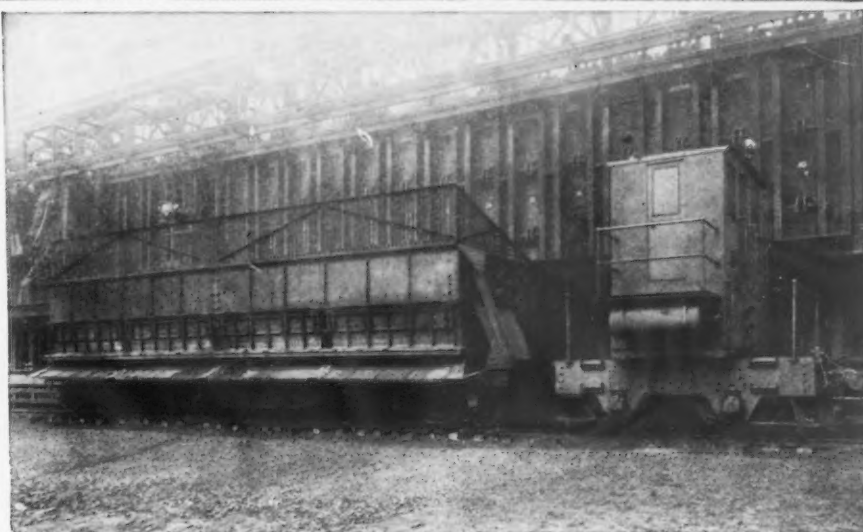
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## NEWS OF INDUSTRY

Hodge & Hammond, Inc., 1162 Grinnell Place, New York  
 Merritt Engineering & Sales Co., Inc., 120 S Niagara St., Lockport, N.Y.  
 Hubert J. Burke, 4 Park Ave., New York  
 Norwalk Lock Co., 395 Broadway, New York  
 Galvin Machinery Sales, 1501½ Main St., Buffalo  
 U. S. Machinery & Motor Co., 395 Broadway, New York  
 Robert L. Clare, 212 Rector St., Perth Amboy, N.J.  
 Consolidated Products Co., Inc., 15 Park Row, New York  
 Interstate Industries, Inc., 149 Broadway, New York  
 John F. O'Mahony, 79 Madison Ave., New York  
 Stephen A. Douglass Co., 630 Fort Washington Ave., New York  
 Gerard Machinery Co., 30 Rockefeller Plaza, New York  
 LeValley McLeod Kinkaid Co., Inc., Elmira, N.Y.  
 United Boat Service Corp., 285 Fordham Place, City Island, N.Y.  
 Aaron Machinery Co., 45 Crosby St., New York  
 Howard F. Wehrle, 1919 Broadway, New York  
 Kent L. Sonnenberg, 870 Seventh Ave., New York  
 Edward L. Carter, 30 Rockefeller Plaza, New York  
 William J. Haehn, 300 Wellman Bldg., Jamestown, N.Y.  
 Fred Bernau, 57 King St., Hillside, N.J.  
 Sharpe Machinery & Supply Co., 50 Church St., New York  
 Building Needs, Inc., 180 Morgan Ave., Brooklyn  
 J. W. Lerew & Co., 405 Lexington Ave., New York  
 Wallace Scrap Iron & Metal Co., 726 W Clinton St., Ithaca, N.Y.  
 Castle Contracting Co., 2058 Lacombe Ave., Bronx, N.Y.  
 Foreign Supply Co., 141 Broadway, New York  
 Gould Sales Service Co., 45 Plaza St., Brooklyn  
 R. G. Miller Co., 30 Church St., New York  
 Douglas Machinery Co., Inc., 150 Broadway, New York  
 Tool Specialties Co., 1172 Raymond Blvd., Newark, N.J.  
 Jerome Eichler, 457 Fifth Ave., New York  
 C. H. Kellow, 110 E 42nd St., New York  
 Fallor Strafer Machinery Co., 22 Pollock Ave., Jersey City, N.J.  
 Bennett Machinery Co., 30 Church St., New York  
 Chas. L. Wachter Engineers, 55 W 42nd St., New York  
 Royal Machinery Exchange, 401 Broome St., New York  
 Anthony M. Meyerstein, Inc., 66 Court St., Brooklyn  
 Ralph Hochman & Co., 52 Edison Place, Newark, N.J.  
 Neafie-Goodrich & Co., 272 N Broad St., Elizabeth, N.J.  
 Hubert C. Fagan, 111 92nd St., Brooklyn  
 John P. Kelly, 224 Tuscarora Rd., Buffalo  
 Everett J. Jewett, Watchung, N.J.  
 Industrial Plants Corp., 90 W Broadway, N. Y.  
 The Watson-Stillman Co., Roselle, N.J.  
 Syracuse Supply Co., 314 W Fayette St., Syracuse, N.Y.  
 C. H. Briggs Machine Tool Co., Inc., Onondaga Hotel Bldg., Syracuse, N.Y.  
 R. V. Osmun Co., 406 Bloomfield Ave., Bloomfield, N.J.  
 Industrial & Marine Service Co., 30 Church St., New York  
 Syracuse Surplus Co., Inc., 107 W Hiawatha Blvd., Syracuse, N.Y.  
 Falk Mill Supply Co., Inc., 18 Ward St., Rochester, N.Y.  
 Globe Machinery Co., 214 Centre St., New York  
 Rudel Machinery Co., Inc., 100 E 42nd St., New York  
 National Machine Tool Bureau, 129 N Walnut St., East Orange, N.J.  
 Amer-Ind, Inc., 420 Madison Ave., New York  
 Victory Cable Co., 217 East Fifth St., New York  
 National Machinery Exchange, 128 Mott St., New York  
 R. Greenberg, 15 Park Row, New York  
 Harrington-Wilson-Brown Co., 405 Lexington Ave., New York  
 F. B. Cutter Co., 50 Church St., New York  
 John T. Hopper, 140 75th St., Brooklyn  
 G. & S. Sales Co., 1259 State St., Schenectady, N.Y.  
 Vandevk Churchill Co., 114 Liberty St., New York  
 Welding Engineering Sales Corp., 110 E 42nd St., New York  
 Associated Woodworking Machinery Corp., 23 Howard St., New York

## COKE OVEN EQUIPMENT



## QUENCHING CARS AND LOCOMOTIVES

All Atlas Coke Oven Equipment is of heavy-duty construction permitting the peak operating conditions required in today's stepped-up production schedules. As a result of years of experience, Atlas is able to design and build equipment, to meet the requirements of each particular coke plant. Detailed information available on request.

### Other ATLAS Products

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Electrically Operated Cars for Every Haulage Purpose	Turntables

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Brooklyn Tool Supply Co., 714 Bedford Ave., Brooklyn  
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Robert J. Hyder Mch. & Tool Co., 88 Exchange St., Rochester, N.Y.  
Herbert Hall Co., 1060 Broad St., Newark, N.J.  
American Air Compressor Corp., Dell Ave. & 48th St., North Bergen, N.J.  
Capitol Machinery Corp., 253 Centre St., New York  
Hartfield-Healy Supply Co., Inc., 190 Main St., Buffalo  
William J. Lohn, Inc., 203 Centre St., New York  
State Mill Supply Co., 98 Park Place, New York  
F. S. Strite, Consulting Engr., 601 W 144th St., New York  
Sun Machinery Company, 36 Van Vechten St., Newark, N.J.  
Surplus & Salvage Co., Inc., 109 N Main St., Jamestown, N.Y.  
Acme Machinery Co., 40 Elizabeth St., New York  
Connolly Merchandising, Inc., Empire State Bldg., New York  
E. J. Sales Co., 1457 Broadway, New York  
E. B. Packard Co., Inc., 114 Liberty St., New York  
Simmons Machine Tool Corp., North Broadway, Albany  
F. N. Potter, 4 Manchester Rd., Tuckahoe, N.Y.  
Asher Machinery Co., 126 S 14th St., Newark, N.J.  
F. Howarth & Son, 517 Market St., Newark, N.J.  
Frederick G. Schranz, 90 W Broadway, New York  
Milton Elster for the Elster Sales Co., 475 Fifth Ave., New York

OKLAHOMA CITY

Machine Tool & Supply Co., 215 E First St., Tulsa, Okla.  
Marshall Supply & Equipment Co., 109 W First St., Tulsa, Okla.

J. R. Lawrence, Manufacturers' Agent, 702 Ritz Bldg., Tulsa, Okla.  
Tulsoma Supply & Equipment Co., 224 E Fourth, Tulsa, Okla.  
Hart Industrial Supply Co., 409 W California, Oklahoma City  
Berry Equipment Co., 1621 E Broadway, Muskogee, Okla.

OMAHA

Ress Machine & Supply Co., 221 S Ninth St., Lincoln, Neb.  
T. S. McShane Co., 1113 Howard St., Omaha, Neb.

PHILADELPHIA

Delta Equipment Co., 148 N Third St., Philadelphia  
H. Loeb & Son, 4643 Lancaster Ave., Philadelphia  
General Machinery & Equipment Co., 180 S 15th St., Harrisburg, Pa.  
Albert Hepworth, 2311 N 16th St., Philadelphia  
Delaware Equipment Co., 124 N Third St., Philadelphia  
Charles V. Fish, 501 Commonwealth Bldg., Allentown, Pa.  
Hahn & Brandt Machinery Co., 465 N Fifth St., Philadelphia  
Alex Mushkin, State Highway, Moosic, Pa.  
York Penn Machinery Co., 28 N Penn St., York, Pa.  
Clarence J. O'Brien, 1032 Commercial Trust Bldg., Philadelphia  
Commercial Electric Motor Co., 116 N Third St., Philadelphia  
The O'Brien Machinery Co., 113 N Third St., Philadelphia  
Kamie Engineering Co., Third & Moore Sts., Philadelphia  
Ajax Machinery Co., 138 N Third St., Philadelphia  
Ace Equipment & Salvage Co., 141 N Third St., Philadelphia  
Machinery & Metals Co., Commercial Trust Bldg., Philadelphia  
Joseph Hyman & Sons, Tioga, Livingston & Almond Sts., Philadelphia

Mickleburgh Machinery Co., 117 N Fourth St., Philadelphia  
Hochman Machinery Co., 720 Chestnut St., Philadelphia  
The Scranton Supply & Machinery Co., Inc., 634 Wyoming Ave., Scranton, Pa.  
Swind Machinery Co., Broad St. Station Bldg., Philadelphia  
L. Albert & Son, 336 Whitehead Road, Trenton, N.J.  
L. M. Gilbert Co., 516 Draxel Bldg., Philadelphia  
Mfg'r's. Sales & Equipment Co., 18 W Cheltenham Ave., Philadelphia  
S. Mann Co., 1630 Vine St., Philadelphia  
Samuel R. Rosenberg, 648 S Seventh St., Reading, Pa.  
James A. Condon, 1710-14 N Fifth St., Philadelphia  
G. Raymond Koehler, 1733 N Fifth St., Philadelphia  
Philadelphia Transformer Co., 2829 Cedar St., Philadelphia  
Adelphia Equipment, 341 N Third St., Philadelphia

PORTLAND

The Portland Machinery Co., 208 S W First Ave., Portland, Ore.  
Feenaughty Machinery Co., 112 S E Belmont St., Portland, Ore.  
Westland Equipment Co., 660 N Tillamook, Portland, Ore.  
Star Machinery Co., 801 S W Front Ave., Portland, Ore.  
Carlson Hatton & Hay, Inc., 94 East 10th Ave., Eugene, Ore.  
J. E. Haseltine & Co., 115 S W Second Ave., Portland, Ore.  
Clyde Equipment Co., 1631 N W Thurman St., Portland, Ore.  
Schnitzer & Wolf Machinery Co., 900 S W First Ave., Portland, Ore.  
Mid-Columbia Supply & Equipment, E Columbia River Hwy., The Dalles, Ore.  
Clyde P. Carroll, 121 SW First Ave., Portland, Ore.  
Tom M. Anderson Co., 1000 W Eighth St., Vancouver, Wash.  
Jack Helsner Machinery Co., 235 NW Second Ave., Portland, Ore.  
George E. Zweifel & Co., 103 S W Front Ave., Portland, Ore.  
Hunters Creek Electric Co., Gold Beach, Ore.  
Balzer Machinery Co., 2136 S E Eighth Ave., Portland, Ore.

RICHMOND

E. W. Waechter Co., Silver Spring, Md.  
Power Machinery, 1498 H St., NE, Washington, D.C.  
The M. Cohen Co., 726-728 Third Ave., Huntington, W. Va.  
Discal Corp., 801 Tower Bldg., Washington, D.C.  
T. W. Newton, 930 F St., Washington, D.C.  
George Z. Anders, Alexandria, Va.  
United States Industries, Inc., 1025 15th St., Washington, D.C.  
Anthony J. Daukas, 76 Chinquapin Village, Alexandria, Va.  
Machine Steel Products Corp., 1525 I St., Washington, D.C.  
Carey Machinery & Supply Co., Inc., 119 E Lombard St., Baltimore, Md.  
Blue Ridge Hardware & Supply Co., Inc., Bassett, Va.  
The Belmar Co., 221 22nd St., Huntington, W. Va.  
Guyan Machinery Co., Logan, W. Va.  
William S. McCormick, 1611 Park Road, NW, Washington, D.C.  
Kirk Machinery Corp., 1420 New York Ave., Washington, D.C.

ST. LOUIS

Henry Fligelstaub Co., 1022 Division St., Evansville, Ind.  
K. P. Wesseling Co., 1221 Locust St., St. Louis  
E. L. Klauber Machinery Co., 3221 Olive St., St. Louis  
Clements Welding Supply Co., 709 Academy Ave., St. Louis

SALT LAKE CITY

The Mine & Smelter Supply Co., 121 W Second South, Salt Lake City  
Western Salvage & Supply Co., 220 W South Temple St., Salt Lake City  
The Salt Lake Hardware Co., 105 N Third West, Salt Lake City  
Olsen Mfg. Co., 4000 Warm Springs, Boise, Idaho  
Bogue Supply Co., 741 W Fourth S St., Salt Lake City

SAN ANTONIO

Stone Machinery Co., 320 Brooklyn Ave., San Antonio, Tex.  
R. L. Bennett & Sons, 802 Sequin St., San Antonio, Tex.

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**NO NEED TO WORRY ABOUT SPRINGS**

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At both B-G-R spring plants, experienced engineering and production skills will meet your needs without delay. From machine guns to vacuum cleaners, from wartime "tracs" to trucks, from airplanes to automobiles . . . whatever shift your plans may require . . . you'll find that B-G-R springs are *quick converters* . . . easing the road back to normal production levels.

**SPRINGS**

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## NEWS OF INDUSTRY

J. H. Wise Co., 701 Milam Bldg., San Antonio, Tex.  
 J. B. Love Equipment Co., 907 Broadway, San Antonio, Tex.  
 Pipkin Motors, Inc., 927 SE Elizabeth St., Brownsville, Tex.  
 Tri-Pak Machinery Co., P. O. Box 1228, Harlingen, Tex.  
 Laundry Equipment Co., 226 E Commerce St., San Antonio, Tex.  
 Procter Sales Co., Transit Tower, San Antonio, Tex.  
 Waldo E. Bugbee, 1802 Alamo National Bldg., San Antonio, Tex.  
 San Antonio Machine & Supply Co., P. O. 660, San Antonio, Tex.

### SEATTLE

Gerrish Machinery Co., 1101 East E St., Tacoma, Wash.  
 West Coast Machinery Co., 1006 First Ave. S, Seattle  
 Buckner-Weatherby Co., Inc., 1743 First Ave. S, Seattle  
 Western Machinery Exchange, Aberdeen, Wash.  
 Superior Steel Co., 1117 Third Ave., Seattle  
 Kinnane Machinery Co., 2727 First Ave. S, Seattle  
 Pickering Machinery Co., 2729 First Ave. S, Seattle  
 Perine Machinery & Supply Co., Inc., 1921 First Ave. S, Seattle  
 Dawson Machinery Co., 2737 First Ave. S, Seattle  
 Star Machinery Co., 1741 First Ave. S, Seattle  
 Sundfelt Equipment Co., 3422 First Ave. S, Seattle  
 Hallidie Machinery Co., 2245 First Ave. S, Seattle

### SPOKANE

W. R. Matthews Machinery & Tool Supply Co., W 421 2nd Ave., Spokane  
 American Machine Works, 1027 W Broadway, Spokane  
 Fred M. Viles & Co., Inc., E 124 Trent Ave., Spokane  
 Turner Bros., 113 S Fourth Ave., Yakima, Wash.  
 Modern Machinery Co., Inc., N 2417 Division, Spokane

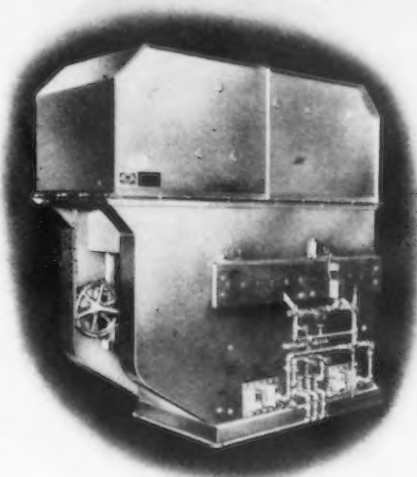
## Removes Silver Ceiling

Toronto

• • • The price ceiling on silver produced in Canada was removed effective Feb. 1, according to announcement by Wartime Prices & Trade Board, and silver now is free to find its own market level. It is stated that the new price for Canadian silver is 71.1c per oz, U.S. currency, the American quotation for foreign refined white metal. If the United States raises the ceiling on foreign mine silver above its present level, the rate in Canada will rise accordingly. The former ceiling price on Canadian silver was 40c per oz.

The chief producers of silver in Canada are Consolidated Mining & Smelting Co., Hudson Bay Mining & Smelting, Noranda Mines, International Nickel Co. of Canada, Waite Amulet Mines, Normetal Mining Corp. and Sherritt Gordon. The new price level represents an increase of about 20c per oz on output from Canadian producers that had not previously been able to take advantage of the foreign market situation.

# 4 CLEANING CYCLES With the Detrex 500-C-1



The latest addition to the line of Detrex standard solvent-vapor degreasers—the 500-C-1—permits the use of any one of four cleaning cycles. One of these is sure to be the correct answer to your vapor-degreasing problem.

1. Vapor
2. Immersion in Cool Solvent—Vapor
3. Vapor—Immersion in Cool Solvent—Vapor
4. Immersion in Boiling Solvent—Immersion in Cool Solvent—Vapor

These phases may be combined to form a cleaning cycle to fit any production requirement.

While retaining the advantages of the larger models, this conveyORIZED degreaser conserves valuable floor space. The machine, available in six sizes, has a large hourly-rated work load capacity. The 500-C-1 is designed primarily for flexible production cleaning. Baskets are loaded at one end of the degreaser, move through the required cleaning cycle, and are returned to the same end of the machine for unloading.

All standard Detrex degreasers are available corrosion-resistant clad or with zinc-spray coated interior surfaces.

Perm-A-Clor or Triad degreasing solvents—depending on your particular requirements—are recommended for use in the 500-C-1.

E-112



# DETREX

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*Corporation*

## Can Company Records Increased Net Sales

New York

••• Continental Can Co., Inc. and wholly owned subsidiaries, reported for the year ended Dec. 31, 1945, consolidated net profit of \$11,067,560 before taxes, compared with \$15,644,985 earned in 1944 before taxes and appropriations made in that year for inventory price decline or other contingencies. "Although sales volume, through curtailment of war production, declined after the end of hostilities, total net sales and operating revenues for the year increased to \$206,071,252, compared with \$174,337,505 in 1944," the report stated.

Consolidated net profits amounted to \$5,767,560 after provision for taxes, equivalent after allowing for dividends on the \$3.75 cumulative preferred stock, to \$1.86 a share on 2,853,971 common

shares outstanding and compare with 1944 earnings of \$6,044,985, or \$2.12 a common share after provision for taxes and appropriations made in that year for inventory price decline or other contingencies.

Renegotiation has been completed for the year ended Dec. 31, 1944, resulting in clearance without refund to the government.

During the year, plant sites were acquired at Weirton, W. Va., and Pittsburgh, and work was started on the erection of a modern can plant at Sacramento, Calif. Other acquisitions, either stock or assets, all purchased for cash, included the Gould Paper Co. of Lyons Falls, N. Y., manufacturers of ground wood pulp and specialties; Bamberger-Kraus & Co. of Pittsburgh, manufacturers of crown caps; Fibre Can Machinery Corp. of Rutland, Vt., makers of paper can manufacturing equipment, and in January, 1946, Filer Fibre Co., Filer City, Mich., manufacturers of sulphate paper.

## American Can Sales Near Record Figure

New York

••• Net sales of the American Can Co. for 1945 totaled \$242,351,862—the second highest in the company's history—and nearly \$15 million above 1944 sales of \$227,528,760. D. W. Figgis, president, told stockholders in the annual report. Net income was \$13,341,614 for the year as compared with \$14,519,443 in 1944, the report disclosed. After deductions for dividends on preferred stock, 1945 earnings equaled \$4.23 a share of common stock against \$4.30 for 1944, which was after a special appropriation of \$1,000,000 for postwar and other contingencies.

The report attributed the difference in earnings to frozen selling prices under OPA ceilings with increases in the cost of labor, and to a reduction in fees earned by special wartime subsidiaries which stopped production after VJ-Day.

Since the company's selling prices at the beginning of 1946 were still frozen, no price increases to cover increased labor costs can be made before January, 1947, Mr. Figgis reported. "The company's contract arrangement with customers," he explained, "provides that price increases to cover increased labor costs can be made only on Jan. 1. Our type of contract has long been a source of satisfactory customer relations and its advantages both to customers and the company have and will continue to outweigh the temporary problem it imposes."

The 1945 volume was attained without benefit of several of the quantity lines which normally account for a large portion of the company's business since their production was still prohibited or restricted by conservation restrictions, Mr. Figgis said. Production was still not equal to present unprecedented demands, the report continued, and was far short of the potential markets that can be satisfied only when sufficient materials and manpower become available.

"The closing of the steel mills created a problem which we shared with thousands of other manufacturers and which was magnified in direct proportion to the duration of the strike."

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## Tool Engineers Will Stress Lowered Costs In Spring Exposition

Detroit

•••The fifth exposition sponsored by the American Society of Tool Engineers is scheduled to open at the Cleveland Auditorium, April 8 and will run through Friday, April 12.

Built around the annual convention of the A.S.T.E., the exposition will cover a wide range of products of interest to production engineers. A total of some 400 different classes of products will be on display at the exposition, with reports from exhibitors still incomplete.

Products to be shown at the exhibit will include virtually every basic classification with which the tool engineer has to deal in determining production methods and equipment to produce better peacetime products at lower cost.

Many of the items to be exhibited will be entirely new, representing, as they do, wartime developments not previously displayed to the industrial public.

Exhibits will be keyed to cost saving and time saving production methods and tools as witnessed by the considerable number of exhibits which deal with power-operated hand tools and the large number of exhibits featuring cemented carbides. The latter represent the single largest class of products, appearing in no less than 17 separate company exhibits, with powered hand tools (electric, pneumatic and hydraulic) featured in 15 exhibits.

Machine tools are not neglected. They run the full range of mechanical and hydraulic presses, lathes of all types, drill presses, tapping machines, milling machines, automatic and hand screw machines, gear hobbers, sawing machines, internal and surface grinders, hydraulic riveters and punchers, resistance welding machinery, broaching machines, precision boring machines, centering machines, honing machines, shapers, injection molding machines, etc.

Of particular interest also will be the numerous exhibits featuring quality control. Faster and higher precision checking devices including electronically operated



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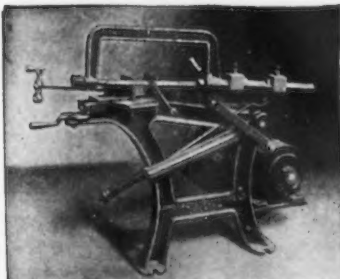
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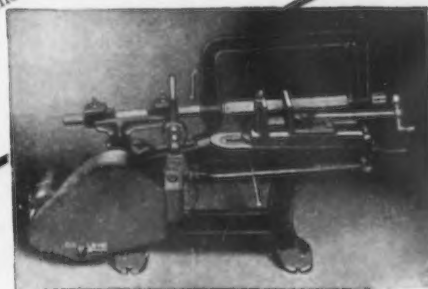
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gaging devices and others which register by sound rather than visually, are to be found in this general classification of products and methods. Some of these devices are capable of automatically selecting parts to tenths of a thousandth. Latest developments in chip disposal equipment, materials handling equipment, air compressors, pumps of all kinds, all electric variable speed machine drives, heat treating furnaces, white blue-printing equipment capable of turning out prints at 30 ft a min, lubricants and coolants will also be on exhibit.

Many of the new devices cannot be properly classifiable under general headings because of their relative newness—including such developments as concrete floor reconditioning machines, honing machines utilizing a vapor blast, gear cutting tools which cut all teeth of a gear simultaneously, jet drilling equipment for accurate drilling of deep holes, crush grind-

ing devices and new types of induction brazing and induction heating equipment.

Cost saving will be the general theme also of all technical sessions. Scheduled for afternoons and evenings during the show week they will cover subject matter ranging from plant layout to new techniques in cutting tools, and from quality control to tool engineering for profit.

**Monday afternoon's** session under the chairmanship of Stephen Urban, Pratt & Whitney Div., Niles Bement Pond, Syracuse, N. Y., will be devoted to the subject of controlling quality, not only as to dimensional tolerances but also as to physical characteristics and the economics of quality control from both standpoints.

This session will be followed Monday evening by a symposium on plant layout and materials handling as it affects and is affected by tool engineering. This session will be under the direction of

W. B. McClellan, Gairing Tool Co., Detroit.

What the tool engineer should know about coolants will be the general topic of Tuesday afternoon's session under the chairmanship of Fred J. Schmitt of D. A. Stuart Oil Co., Chicago. This will be followed by a symposium on "New Techniques in Cutting Tools," Tuesday evening, with Richard W. Ford of Kearney & Trecker Corp., Milwaukee, as chairman. This session will deal not only with the cutters themselves but also with cutter materials and uses of new techniques.

Simultaneous sessions on Wednesday afternoon will be devoted respectively to (a) tool engineering education, with ASTE Educational Committee Chairman Otto Winter presiding, and (b) tooling for permanent molds and extrusion. The latter session will be chaired by Earl V. Johnson of Firth-Sterling Steel Co., Dayton, and will deal with the subject from the standpoint of the product involved, the tooling required and uses of the processes. The second half of the educational session will be held Wednesday evening.

A single technical session is scheduled for Thursday, since the annual banquet is to be held Thursday evening. This afternoon session will deal with "Tool Engineering for Profit," a symposium on determining how to engineer production methods and equipment to produce a given number of parts at minimum cost. It will deal with the variations in tool engineering required when quantities to be produced are large or small, or somewhere in between. Chairman of this session is H. E. Linsley, technical editor, THE IRON AGE.

A single session on Friday afternoon will wind up the technical program. This session, under Roland E. Lockridge, National Automatic Tool Co., Inc., Richmond, Ind., will study the subject of special machine design as affected by use of different types of machine controls. Thus, the influence on such designs of hydraulic, electronic and mechanical controls will be discussed.



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## Says New Developments Will Reveal Additional Manganese Resources

Washington

• • • "Mining and production increases rather than depletes the known reserves of manganese ore in the United States," J. Carson Adkerson, president of American Manganese Producers Assn., stated recently. "Additional developments will undoubtedly disclose additional reserves. The manganese reserves in the United States have hardly been scratched.

"The U. S. Geological Survey, in 1910, reported that 'The manganese deposits of the Appalachian region are the most important in the United States' (U. S. G. S. Bulletin 427, p. 101). This region, at the time, was not known to have as much as 500,000 tons of manganese ore reserves: Other manganese districts of the U. S. were barely known. Today, Montana alone ships more manganese ore than the whole Appalachian area combined and the product is of higher grade than any other ores in the world.

"Representatives of the Bureau of Mines have recently testified that the United States has a proven or developed reserve of manganese ore sufficient to last two years, and submarginal or undeveloped reserves sufficient to last from '100 to 300 years,' or in the neighborhood of 100,000,000 to 300,000,000 tons. These reserves are submarginal, to be sure, which means it may cost more to produce them in the United States than in foreign countries. But—the shipments, new reserves, and new processes brought to light in the United States since 1914 have come through development and production and not through the concept of 'conservation' which would keep mines idle.

"If a strict policy of 'conservation' had frozen our manganese developments in 1914 we might still have less than 1,000,000 tons in reserve. Through mining, production, and metallurgical research since 1914 the country has benefited from the shipment of more than 9,300,000 tons of ore and our indicated reserve of manganese has been multiplied more than a hundred fold."

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## NEWS OF INDUSTRY

### Announces Operation Of Gas Turbine Plant

Milwaukee

• • • Successful operation by the Navy of an experimental gas turbine plant at a gas temperature of 1350 deg F has been announced by Allis-Chalmers Mfg. Co., builders of the plant.

Designed and built for eventual operation with hot gas at a temperature of 1500 deg F, the 3500 hp unit has been undergoing a series of successively increasing temperature tests at the U. S. Naval Engineering Experiment Station, Annapolis, Md.

Although the big multi-stage gas turbine for continuous power generation was developed as a Navy project, its basic elements have characteristics suitable for both land and marine practice, according to Allis-Chalmers engineers. The Annapolis unit embodies innovations in cooling methods, permitting safe operation and high inlet temperature by avoiding the

undue weakening effect of the high temperature on the materials used for the rotating parts, it is stated.

The gas turbine plant is arranged with two turbines operating in parallel, one turbine supplying the power required to drive the compressor, the second turbine furnishing the power necessary to satisfy the requirements of the driven machine or dynamometer. The compressor unit operates at a speed commensurate with the lowest possible fuel consumption. Fresh air enters the compressor at 40,000 cu ft per min and is discharged at a pressure of 45 lb per sq in. to the heat exchanger where it picks up heat from the turbine exhaust gases. The heated air then passes through two separately oil fired combustion chambers where it is further heated to the desired turbine inlet temperatures. The gases then expand in two multi-stage turbines, one of which supplies the power to drive the compressor, the other furnishing external shaft power.

**HOT STUFF:** Experimental gas turbine built by Allis-Chalmers of Milwaukee, Wis., undergoing temperature tests at Annapolis, Md. Designed for 1500°F, it has been used successfully at 1350°F.

